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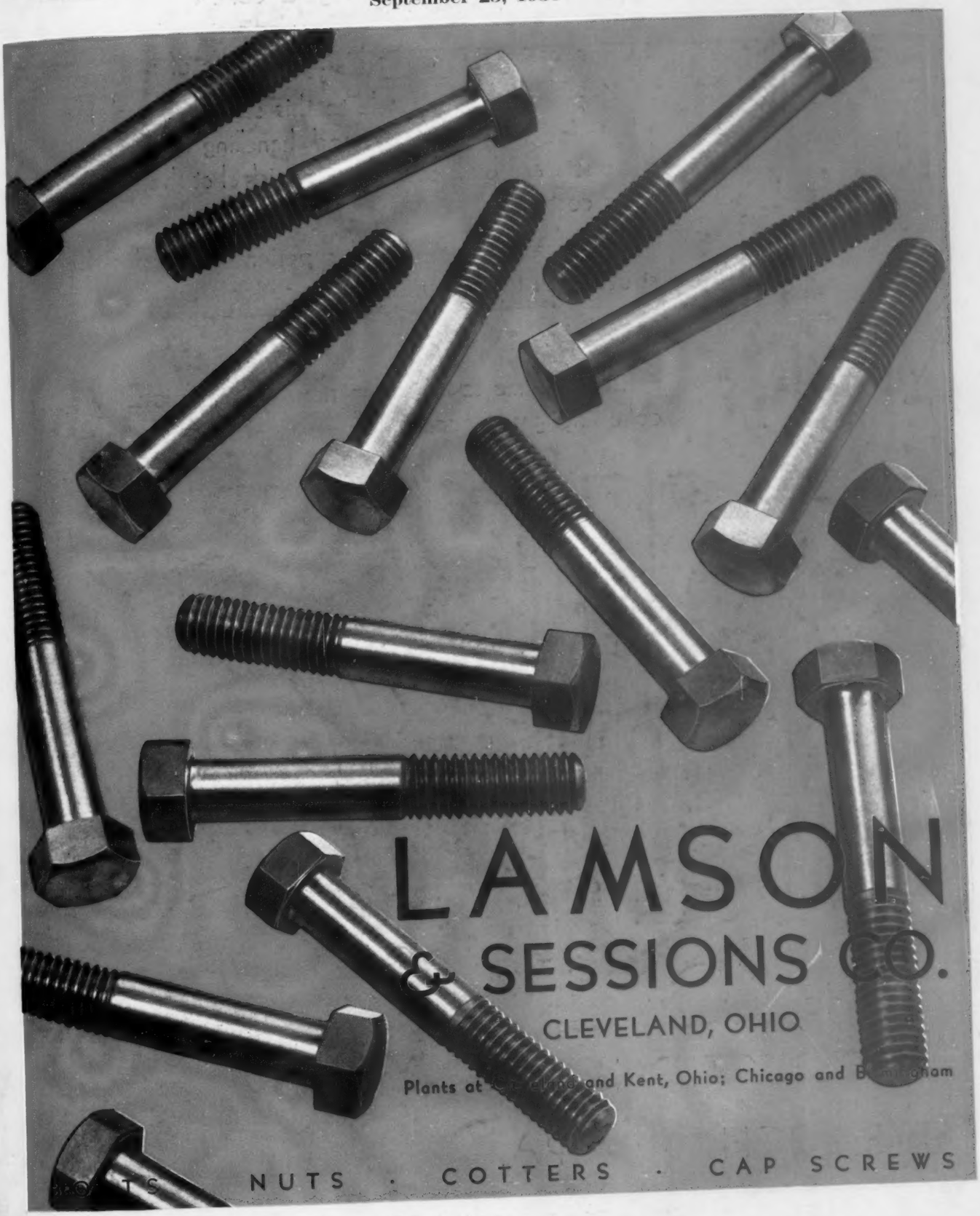
IRON TRADE REVIEW
STEEL
September 25, 1930



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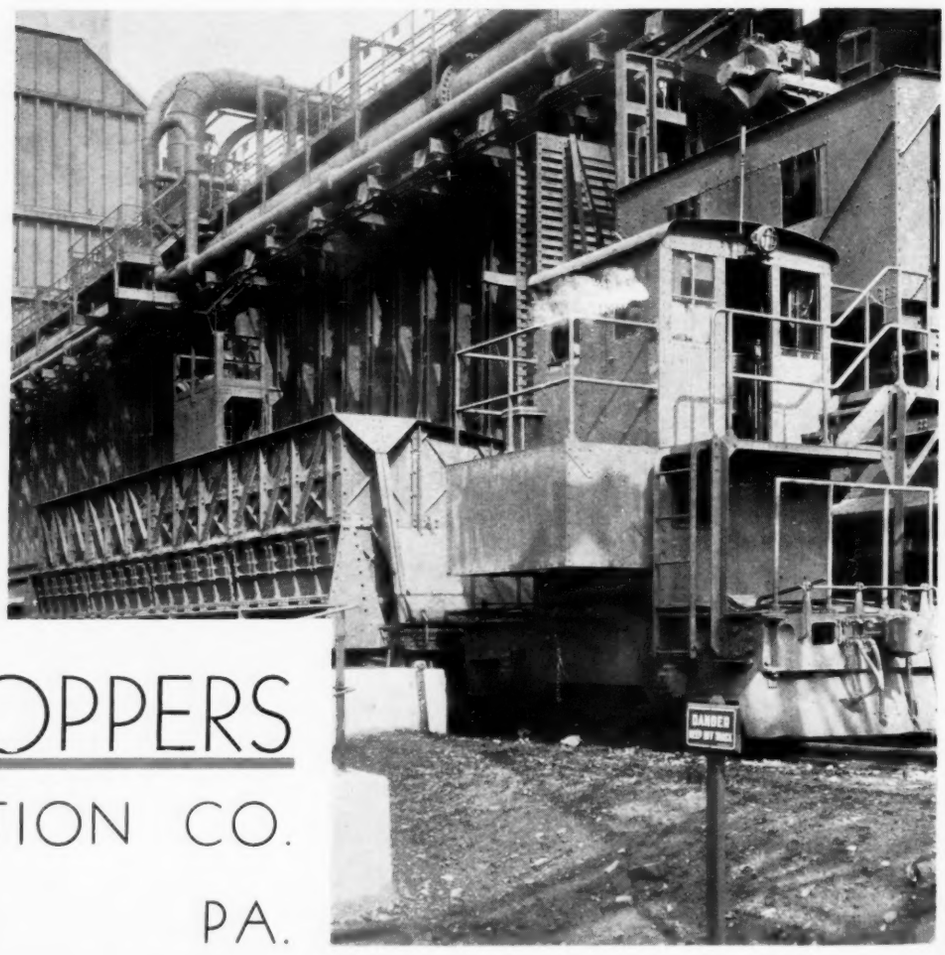

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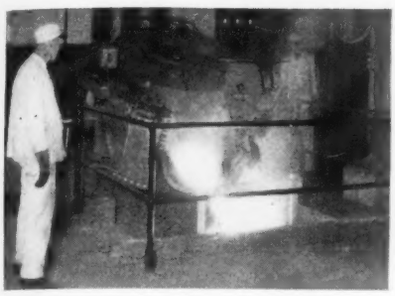

New Ohio Foundry Casts Chrome-Nickel Steel. Page 54.

THIS WEEK:

BUSINESS on the Pacific coast and in the Pacific Northwest is improving moderately, orders for steel being more numerous and tending to gain in size. Large highway and other public projects are encouraging. The industrial payroll in the state of Washington for the first half of 1930 *was larger than in the same period in* 1929, *though the logging industr operating at 40 per cent.* ST.. *keeps its readers informed with a page of western market news once a week, this week page* 88.

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Volume 87 Number 13

IRON TRADE REVIEW STEEL

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

EUROPE proves after all to be a well-wisher of the United States. Though piqued at the top addition to our tariff wall, distressed by the diminished volume of tourist trade, wracked by financial strains traceable in some measure to war debt settlements, England and the Continent look hopefully across the Atlantic for the first signs of improvement in business. It is noteworthy acknowledgement indeed for a London editor to write: "The initial impulse leading to a world recovery of trade cannot come from this country. America is the flywheel of the world's economic machinery today and must revolve full speed again before all the wheels can be set spinning elsewhere." And he may be right, for a survey of the iron and steel industry of Europe (Page 23), which no doubt reveals a cross-section of all industry, indicates Europe is one lap behind the United States in the economic cyle. Those countries of Europe which have been depressed show no improvement; the few which have enjoyed a fair measure of trade—notably France—appear to be slipping; there is little confidence anywhere. But in the United States sentiment unquestionably is rising from the dumps and any change is bound to be for the better. The "initial impulse" may be in its first beat.

Steel Is Supplying Moderate Impulse

In steel, this impulse is not overpowering but it is discernible. So broad is the market for steel that to make a hasty appraisal of the leading consuming groups as a whole results in misleading conclusions. The sum of moderate, unrelated bulges in demand, varied as to products and districts, continues fair considering general conditions of trade and excluding comparisons with abnormal 1929 (Page 67). . . . Chicago has been looking all summer to the implement trade for its fall impulse (Page 32) but apparently the scepter has passed to the railroads, which now indicate they will purchase more rails and fastenings for 1931 than first expected. . . . An international object lesson is afforded by failure of the European steel entente to control, or even stabilize prices in a period of depression, while the common understanding among American steelmakers not to take cut prices out of labor has resulted in a much more wholesome situation (Page 34).

Natural Gas Fuses Equipment Builders

For mergers with a high degree of economic logic there is no closed season. Two manufacturers in Ohio have been specializing on natural gas fired furnaces, largely for the steel industry. One has concentrated on equipment for the

Wide World Photo

Save from an airship, never before has the American flag fluttered so high. The flag raising atop the Empire State building, New York, 1048 feet above street level, signals that 46,000 tons of structurals have been erected. A dirigible mooring mast will carry the height to 1428 feet

roughing operations, the other for finishing. These complementary businesses are now being merged (Page 26), offering further opportunity for research and more economical production. . . . At Youngstown, the Bethlehem-Sheet & Tube merger trial drags on, although noticeably drawing to a close. Last week three of the more important principals—Samuel Mather and H. G. Dalton, for the merger, and Cyrus E. Eaton, arch-opponent—testified, it being Mr. Mather's first appearance ever as a witness. (Page 28).

Foundries Withstand New Competition

Penton's Foundry List for 1930-31, just published, gives the foundry industry the low mortality rate of 2.8 per cent for the two years ended Aug. 15. At the biennial roll call, 5919 foundries in the United States and Canada responded, 170 fewer than on Aug. 15, 1928. By coincidence, the shrinkage in active foundries from 1926 to 1928 also was exactly 170. More efficient labor, improved production equipment and mergers have militated against the foundries numerically, but it is believed the capacity for castings is fully as large as two years ago. . . . In fact, wide acceptance of heat and corrosion-resistant steel castings has made it necessary for many foundries to expand their facilities. An example is a company in Ohio which has erected a plant devoted exclusively to the manufacture of chrome-nickel alloys of three principal compositions. In addition to a general line of castings to withstand high temperatures, tubes of the same alloy in diameters 4 to 16 inches and lengths to 9 feet are cast centrifugally (Page 54).

Protecting Pipe Lines Major Problem

With the rapidly increasing construction of underground pipe lines, protection from soil corrosion has become a problem of major importance. The application of protective coatings has been accepted as a preventive but not as a cure. To establish a seal about the metal and thereby exclude the agents making for deterioration is, of course, the goal. A development of the past two years is a mechanical means (Page 57) for applying coating materials and fabric wrappings at pipe mills, of which six now utilize this method. . . . Manganese continues to edge into the news. Washington still is considering the request of domestic producers that the anti-dumping provisions of the tariff law be invoked against Russian imports. Steady inroads have been made by the soviet in supplying the German market (Page 26). In the steel and iron industry manganese serves a two-fold purpose—its confers characteristic properties on the metal and is active in deoxidizing and degasifying it, the latter effect being the more important. Extreme care must be taken in melting or the desired characteristics and qualities will be impaired. It has been found (Page 47) that many defects can originate in the melting furnace or ladle.

Two Tariff Walls Now on Canadian Border

Canada under the leadership of R. B. Bennett, new Conservative premier and finance minister, is moving with rapidity and directness to throw a protecting blanket over her industries. As of Sept. 17 higher duties (Page 26) were made effective on some 130 products, selected because the expected increased demand for the Canadian-made article promised the most expeditious relief for the unemployed. Rates are in three tiers—the lowest being British preference, the intermediate applying to those nations having trade treaties with the dominion, and the highest assessed against the United States. Anti-administration newspapers in this country decry this mounting barrier to Canadian trade, but not without ironic references to the eye-for-eye doctrine. . . . Bolt, nut and rivet manufacturers are obviously relieved by the decision of the war department (Page 33) not to accept bids opened Sept. 9 for 16,000,000 pieces of these products stored at the Jeffersonville, Ind., depot. A menace to convalescent trade is removed, without depriving the treasury of substantial revenue. . . . As they lead this week to Chicago for national metal week, so will all roads lead to New York Oct. 24 when the American Iron and Steel institute holds its fall session (Page 33). President Farrell will have returned from Europe with some timely impressions; there will be the usual corridor settlement of the important problems.

Tin Plate Demand Survives Drought

To the surprise and gratification of manufacturers of tin plate, their market has been much less seriously affected by the drought than was first feared (Page 33). Corn and late vegetables in the Middle West survived, and canners are now operating night and day. . . . Wrought iron will be manufactured on the largest scale in its history beginning in October when the new mill in the Pittsburgh district, based on the Aston process and having a monthly capacity of 45,000 tons, is officially opened. (Page 26). . . . Miniature golf is largely responsible for a 100 per cent increase (Page 31) in the operations of a Wisconsin manufacturer of golf clubs. Budgeting normally cannotes finance, but it can also be made to apply to man-hours of materials. In a certain steel plant has been developed a method of controlling waste of labor and materials (Page 45) which not only reduces costs but also increases production.

Europe, Depressed, Looks to America To Lead Recovery

By Vincent Delport
European Editor, STEEL

WHEN one is under a spell of adversity, it is no consolation to be told that many others are suffering from similar misfortunes. Such is the position today concerning the economic conditions of most nations. A wave of depression has spread over Europe and beyond its shores, and even in those countries that, until recently, were enjoying comparatively prosperity the immediate future is contemplated with apprehension.

While the depression is general, each country reacts in its own way and views its problems from an angle peculiar to itself. We have reached a time when certain factors relating to production and trade in one or another of the leading nations react on every one of them; when drastic remedies are proposed in one case, it is not always possible to foresee the consequences upon the rest of the world.

Some time ago the editor of a leading London Sunday paper, in referring to employment and prosperity in Great Britain, made two statements of importance. He said: "The initial impulse leading to a world-recovery of trade cannot come from this country. America is the flywheel of the world's economic machinery today, and must revolve full speed again before all the wheels can be set spinning elsewhere."

Further, alluding to the various schemes propounded in many quarters to abolish or reduce tariffs generally, he wrote: "The truth is, that nowhere in the world is there an effective movement nor any sign of one for real free trade." And again: "There is no genuine free trade issue anywhere." These words were not written without their meaning having been well weighed.

Here it is recognized that America holds a place of primary importance in world trade. In the statement we have quoted there is no trace of fear, jealousy or base motives. There is, on the contrary, the implied hope that America soon will weather her own storms and again lead the way to prosperity. From those words can be deduced the recognition of the fact that the world will prosper, if America prospers and co-operates with the rest of the world. Of course, the word "co-operation" has a bilateral meaning.

At present the transition of thought from American prosperity and its influence on the rest of the world to the tariff question can be readily made. What of tariffs? While schemes for a European union, the basis of which is obscure, are being discussed by statesmen, representative leaders of industry and trade from various countries are studying the possibilities of loosening the fetters of international trade.

In the meantime, many nations are strengthening their protective walls, and an influential section of the British people is clamoring for free trade within the Empire and a duty against foreign goods.

Following the present trend, one could visualize in the future three powerful units, each surrounded by a variety of means of protection affording but few loopholes: The United States, the British Empire, the European Union.

Business Conditions in Europe Today

Norway	Fair
Sweden	Fair
Finland	Fair
Esthonia	Poor to fair
Latvia	Fair
Lithuania	Fair
Poland	Poor to fair
Germany	Poor to fair
Denmark	Fair
Holland	Fair
Great Britain	Poor to fair
Belgium	Poor to fair
Luxemburg	Poor to air
France	Fair
Spain	Poor to fair
Portugal	Poor to fair
Italy	Fair
Switzerland	Poor to fair
Austria	Poor to fair
Czecho-Slovakia	Fair
Hungary	Poor
Rumania	Fair
Yugo-Slavia	Fair
Albania	Poor to fair
Bulgaria	Fair
Greece	Poor to fair
Turkey	Poor
Russia	Undetermined

All Countries Report Recession

GREAT BRITAIN is one of the countries in Europe that most acutely feel the effects of the present wave of depression. This country has certain difficult and complex problems of its own, and until they are satisfactorily solved these difficulties will add their detrimental effects to those resulting from outside causes. For this reason, British industry and trade will probably take longer to recover than would be the case in other countries.

In the pig iron districts of Barrow-in-Furness and Middlesbrough, conditions are uncertain; some furnaces have been blown out, and little progress is being made toward recovery. In and around Birmingham the iron and steel trade continues slow, and in the heavy branch of the engineering industry conditions remain depressed, with few signs of improvements, with the exception of electrical engineers and boilermakers, who are fairly busy. In the Manchester district, orders for locomotives have been received from overseas.

The Scottish coal trade is depressed, and the situation of the iron and steel industries around Glasgow continues unsatisfactory. Shipyards have been active, and during the first half year 116 vessels, of 294,000 tons gross, were launched, which was less by four vessels, but more by 8435 tons, than in the corresponding period of 1929. The outlook is better.

In South Wales and in and around Newcastle, the coal, iron and steel and shipbuilding industries are depressed or marking time. In Belfast, Ireland, shipbuilding has been quiet during the summer months. A bright spot is the automobile industry, which has received a fillip from the maintenance of the import duty in this year's budget. Manufacturers are busy with their preparations for the automobile show at Olympia, London, in October.

Taking the country as a whole, there are few signs of a serious revival, and the general outlook is far from bright. Unemployment increased considerably during the summer, more than 2,000,000 being idle.

Considering more especially the iron and steel industries, production of pig iron in the first seven months was 4,206,200 tons, compared with 4,269,800 tons in 1929. There were 105 blast furnaces operating on July

31, against 167 on July 31, 1929. Pig iron output has thus shown a decrease of 1.5 per cent.

Output of steel has declined by 12.5 per cent, from 5,687,500 tons to 4,983,100 tons. Foreign trade returns show a deterioration in iron and steel exports, from 2,613,633 tons in the first seven months of 1929 to 2,100,984 tons this year, while imports increased from 1,577,025 tons in the first seven months of 1929 to 1,731,827 tons this year.

There is one aspect of the British iron and steel industries that is promising. It is the big strides made in the reorganization of the more prominent concerns by the amalgamation of allied interests, or by working agreements that permit of a better utilization of the more efficient works, the closing down of uneconomic plant, and a redistribution of capital and assets.

GERMANY has over 2,000,000 unemployed receiving relief. In addition, there are some 800,000 who are not fully employed, and who do not obtain relief. Thus there are about 1,000,00 more people out of work than in Great Britain. It is true that Germany has a population 55 per cent greater than that of Great Britain, and an area 125 per cent larger; furthermore, unemployment figures in Germany fluctuate more than in Great Britain. The figures quoted above, however, are an indication of the depressed condition of the German industries in comparison with last year.

Some disappointment is expressed concerning the results of rationalization, resorted to on a large scale since 1925. It is recognized that plants are more efficient and that output per man has considerably increased. It has been found, however, that, since rationalization, the interest on capital is relatively small, and, more particularly, that amalgamations, the closing down of inefficient plant, and the increasing use of machinery are displacing labor.

Iron and steel production has materially decreased during the first seven months. Output of pig iron during the period considered dropped from 7,772,598 metric tons in 1929 to 6,363,657 tons this year, and the output of raw steel decreased correspondingly from 9,789,-351 tons to 7,487,589 tons, showing a drop of 18.2 per cent for pig iron and 23.7 per cent for steel.

FRENCH foreign trade figures are shrinking, both as regards imports and exports, and this indicates a slowing down of economic activities, which for some time past had been distinctly more favorable in France than in most other nations. This tendency also is noticeable in a slight decrease in the revenue of the five railroad companies. However, the financial position of the country is strong, and business in the home market is fair, although the outlook for the future is less confident.

Output of iron and steel in France during the first seven months was 6,044,000 metric tons of pig iron and 5,604,000 tons of steel ingots and castings. These figures are just slightly less than the figures of the corresponding period of 1929, and this year output is following a downward trend. There are many factors that should cause considerable activity to be maintained in France during the coming months, but prices are falling, and the peak of the recent period of comparative prosperity has been passed.

BELGIUM and Luxemburg depend to a large extent on their iron and steel industries, and export trade plays an all-important part in the destinies of those industries. This accounts for the considerable depression now felt in these countries, for demand from foreign markets is abnormally low, while domestic consumers are following a hand-to-mouth policy. Several furnaces have been put out of action, and many works are operating on a part-time basis.

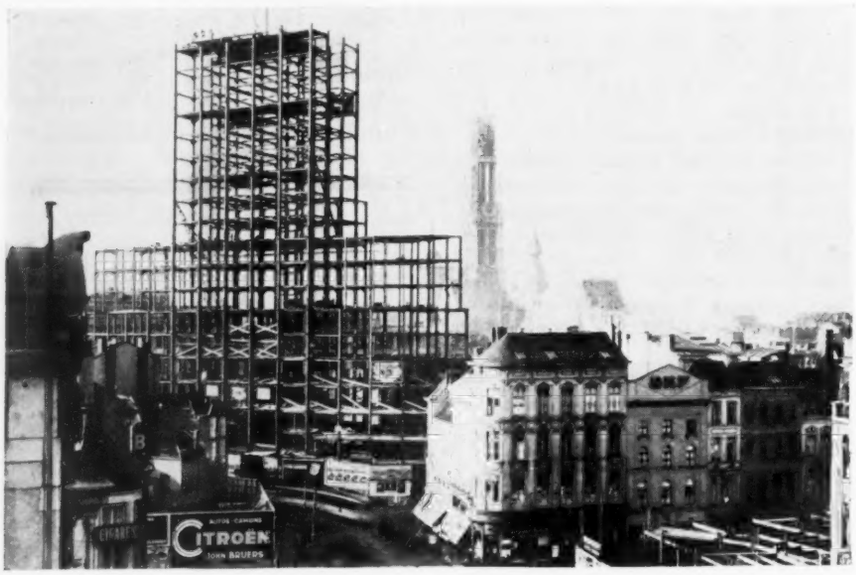
In both Belgium and Luxemburg iron and steel production figures are consistently dropping. In Belgium, production of coal is higher than consumption, and this has led to fresh increases in stocks, now estimated at over 1,000,000 tons. The particular conditions pertaining to Belgium and Luxemburg cause these countries to react more quickly favorably and unfavorably, to outside influences than is the case elsewhere.

CZECHOSLOVAKIA'S position in the steel trades also has deteriorated, and production is receding. Whereas the large concerns still are quite active, the smaller works find it difficult to replenish their order-books, and unemployment is on the increase. Similar conditions obtain in the machine tool industry.

In Austria production is being curtailed. Co-operation with neighboring German enterprises is on the program, with a view to establishing a common plan of electrical distribution.

Conditions in Poland are less satisfactory than a year ago, and iron

(*Concluded on Page* 88)



FIRST COMMERCIAL SKYSCRAPER GOES UP ON CONTINENT

This bank building being erected in historic Antwerp, Belgium, is described by STEEL'S *European manager as "the first real skyscraper on the Continent," no doubt referring to the commercial character of it, as the Eiffel tower, Paris, 984 feet high, is the daddy of them all. The main building has 12 stories, and the tower 28, the height being 390 feet. The major portion of the beams were rolled in accordance with the Grey patents, in Differdange, Luxemburg*

Metal Masts Help Keep Cup

Much credit for retaining the international yacht cup in 1920 was given to the steel mast of the RESOLUTE, which bested Sir Thomas Lipton's SHAMROCK IV. A duraluminum mast was a feature of the ENTERPRISE, which recently successfully defended the cup from Sir Thomas' latest challenger.

Seek Higher Scrap Rates

Chicago—Western trunk lines propose to make the freight rate on shipments of scrap for remelting purposes, 50,000-pound minimum, 17½ per cent of first-class rates. This would usually increase rates on short hauls and lower them on long hauls. The proposal would affect scrap rates from the Mississippi river to the Rocky mountains.

Watson New Head of Steel Treaters; 1931 Meet to Boston

NATIONAL Metal week is in full swing at Chicago with all participating groups conducting technical sessions. These included the American Society for Steel Treating, American Welding society, Institute of Metals and iron and steel divisions of the American Institute of Mining and Metallurgical Engineers, and machine shop practice and iron and steel divisions of the American Society of Mechanical Engineers. All meetings are in the Stevens hotel with the exception of the Welding society, which is maintaining headquarters at the Congress hotel.

Nomination of John M. Watson, metallurgical engineer, Hupp Motor Car Corp., Detroit, to be president of the American Society for Steel Treating in 1931 was announced early Monday. Mr. Watson now is vice president and for two years prior was treasurer. A. H. d'Arcambal, metallurgist, Pratt & Whitney Co., Hartford, Conn., now a director, was nominated vice president, and W. H. Eisenman, Cleveland, was selected to succeed himself as secretary.

Nominated for Directors

Directors nominated were B. F. Shepherd, metallurgist, Ingersoll-Rand Co., Phillipsburg, N. J., and F. B. Drake, president, Johnson Gear Co., Berkeley, Calif. Since only one candidate is named for each office, nomination virtually assures election. A mail ballot will be sent out in November and the offices will be assumed on Jan. 1, 1931. These officers with R. G. Guthrie, metallurgist, Peoples Gas Light & Coke Co., Chicago, 1930 president; A. O. Fulton, president, Wheelock, Lovejoy & Co. Inc., Cambridge, Mass., treasurer; and directors W. B. Coleman, president, W. B. Coleman Co., Philadelphia, and O. E. Harder, assistant director, Battelle Memorial institute, Columbus, O., will constitute the board of directors.

Despite the fact the metal exposition is somewhat smaller than in previous years because of lack of space, the show is spread widely over the hotel and offers a favorable comparison. At the same time, considerable equipment, notably furnaces, is not operating. Nevertheless it is advantageously displayed. Conducting an exposition under the same roof with technical sessions of the congress is somewhat of an innovation, but one which is receiving favorable comment on every hand.

Boston has been named the thirteenth National Metal week city, Sept. 21-25, 1931. Headquarters of the congress will be in the Statler hotel and the exposition will be on the Commonwealth pier.

Great Lakes to Build 10-Inch Merchant Mill

Directors of National Steel Corp. have authorized Great Lakes Steel Corp., its Detroit subsidiary, to proceed with the erection of a 10-inch merchant mill. Work on this mill will be started shortly, and is expected to be completed and in operation by June 1, 1931. A 14-inch merchant mill is now in the course of construction at the Detroit plant and will be in operation early in December. These two mills, in addition to the new mill now being installed at the Weirton, W. Va., plant of Weirton Steel Co., another subsidiary, will give National a wide range in merchant material.

Republic Shows Order Gain

Orders booked by the Republic Steel Corp., Youngstown, O., during the first three weeks of September were 17 per cent ahead of the same period in August, according to corporation officials. The improvement represents sales of strip, sheets, electric-welded pipe and other products. Alloy steel orders are holding the gains which appeared last month.

As a result of the betterment in orders operations are gradually increasing. Two additional open-hearth furnaces, one at Youngstown and the other at Warren, O., have been put in operation. Sheet mill operations will be increased this week.

Significant Developments of the Week in the World of Business

Patrick E. Crowley, president, New York Central railroad: "Business looks as though it has started on the upgrade again. That is the conclusion I draw not only from statistics of New York Central freight loadings, but from observations on a tour of inspection of the road's system."

K. C. Hogate, general manager, *Wall Street Journal:* "If corporations would disburse their surplus cash to the rightful owners, the stockholders, a sum approaching $4,000,000,000 would flow into channels of trade and frozen cash would be put to work. This as a relief measure to stimulate business and remove unemployment."

James A. Campbell, chairman, Youngstown Sheet & Tube Co., Youngstown, O.: "I am glad to note there is considerable resistance to lower steel quotations. Judging from inquiries from customers, this hardening of prices indicates actual orders soon will be received in a larger way."

Mesta Machine Co., Pittsburgh, has unfilled orders on its books sufficient to insure continuous operations of its machinery departments the remainder of 1930 and with some carry-over into 1931, states a report of the Standard Statistics Co., New York.

Western Electric Co., Chicago, believing the present price of copper warrants covering requirements through the remaining months of 1930, has purchased enough copper in the past six weeks to supply the Bell telephone system into January.

"If people during the next two weeks were to spend $5 more on the average than they have been spending the business depression would be over," declares William T. Foster, director, Pollak Foundation for Economic Research, New York.

Sir William Morris, wealthy British automobile manufacturer, is organizing "a national council of industry and commerce" to try "to bring into political life that measure of common sense without which the business of the British empire cannot be conducted." Leading industrialists are on the council.

Northern Ohio purchasing agents, meeting recently at Canton, O., agree that increased orders are probable in 30 to 90 days. Youngstown Pressed Steel Co., Warren, O., looks for improvement, as does Timken Roller Bearing Co. and Central alloy division of Republic Steel Corp. Brown Clutch Co., Sandusky, O., is increasing its labor force from 50 to 75 men to handle foreign orders.

J. C. Fields, sales manager, Chrysler Corp., Detroit: "Leave business alone and it will take care of itself. There are too many statements issued with the idea of pumping up business. The result is everybody thinks business must be rotten. Leave it alone and the results will speak for themselves."

Canada Raises Tariff, Highest Rates Applying to United States

HIGHER tariff duties on 130 products, including steel, were made effective Sept. 17 by Canada at a special session of parliament in fulfillment of the campaign pledge of R. B. Bennett, new conservative premier and finance minister, to stimulate employment and conserve the Canadian market for Canadian manufacturers.

The changes already in effect apply chiefly to products and industries most likely to respond and reduce unemployment promptly. Further changes will be made at the next regular session of parliament. The new conservative government has taken steps to prevent Canadian market prices being advanced, in some cases exacting pledges from interested industries not to increase prices without proving the necessity.

The new tariff provides three classes of duties—British preference, intermediate and general. The British preference prices are the lowest. The general are the highest and apply to the United States and other countries having no reciprocal trade agreements with Canada. The intermediate rates apply chiefly to European countries having Canadian trade agreements.

The new rates on steel and allied products are:

Steel plates not over 40 inches wide, $4.25, $6, $7.

Steel shapes or sections, not drilled or punched, weighing not less than 35 pounds per lineal yard, including I-beams, angles and zees up to 6 inches, $4, $6, $6.

Steel angles, beams, channels, collumns, girders, joists, piling, not punched or drilled, $4.25, $7, $7; same when punched or drilled, 25 per cent, 25 per cent, 40 per cent.

Cast iron pipe, valued at more than 5c per pound, $7, $12, $14.

Bars, rods, etc., weighing less than 60 pounds per lineal yard, $4.25, $7, $7.

Wire rods, for drawing into wire, $2.25, $5, $5.

Steel ingots, $1.50, $3, $3.

Sheet bars, blooms, billets etc., $2.50, $4.50, $4.50.

Magnesite, dead-burned or sintered, 20 per cent, 25 per cent, 25 per cent.

Formerly, structural shapes were dutiable at 35 per cent, and cast iron or steel pipe at $10 a ton.

The changes do not apply to goods already imported but not entered, nor to goods purchased and in transit to Canada before Sept. 16.

Asks Aluminum Alloy Cut

Washington—The federal tariff commission has an application asking for the full 50 per cent reduction allowable under the provisions of the flexible tariff law on ferrosilicon aluminum. The name of the applicant is withheld. The commission has not ordered an investigation on the application to this time.

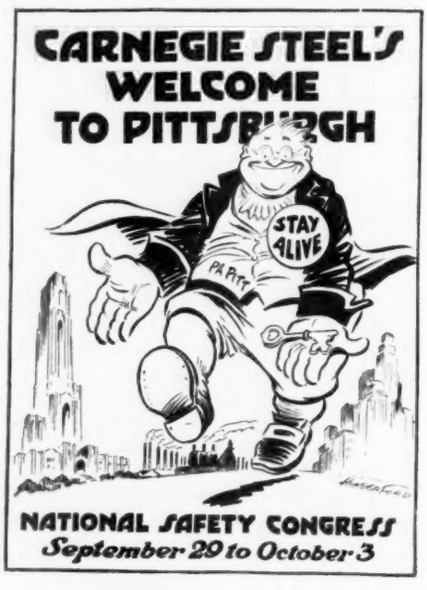
Surface Combustion Now Controls Chapman-Stein

Surface Combustion Co., Toledo, O., has completed negotiations for acquisition of the Chapman-Stein Co., Mt. Vernon, O., through exchange of stock.

The Chapman-Stein Co., a subsidiary of the Cooper-Bessemer Corp., has specialized in soaking pits and the roughing operations of the steel industry. The Surface Combustion Co., a Henry L. Doherty subsidiary, has specialized in gas-fired industrial furnaces for finishing operations in the steel mill and automotive industries.

According to B. B. Williams, president of the Cooper-Bessemer Corp., and Henry L. Doherty the purpose of the merger "is to permit more rapid development of furnaces and processes for the more efficient use of gas. The rapid expansion of natural gas distribution, in which both companies are heavily interested, has given a great stimulus to the use of gas for all heat-treating operations."

The entire Chapman-Stein organization will shortly be transferred to Toledo. George McDermott, general manager of the Chapman-Stein Co., is becoming vice president and chief engineer of the steel mill division of the Surface Combustion Co. Frank H. Addams, vice president and general manager of the latter company, announced the merger.



STEEL FOR SAFETY

One of the pioneers in the industrial safety movement, Carnegie Steel Co. has circulated a poster depicting Pa Pitt rushing down the street to welcome seven or eight thousand safety men to the National Safety council's congress in Pittsburgh, the week of Sept. 29. The council has held 19 congresses and this is said to be the first time an industry has postered the event

Soviet Is Shipping More Manganese to Germany

Washington—Russia is the big source of Germany's manganese requirements, the department of commerce report states. In the first half of 1930 Russia shipped to Germany 75,563 tons of that country's total import of 196,476 tons. British India provided 53,257 tons and Australia 50,038 tons. In the second quarter, receipts from Russia increased 17,000 tons, those from Australia decreased 17,000 and from British India 8000 tons.

Byers Opens Ambridge Wrought Iron Plant Oct. 8

A. M. Byers Co., Pittsburgh, will officially open its new $12,000,000 plant near Ambridge, Pa., Oct. 8. The company gradually has been consolidating its manufacture of wrought iron in the Pittsburgh district, anticipating the opening of the new mill which will have an ultimate capacity of 45,000 tons a month. Iron will be produced by the Aston process.

The new Ambridge mill will afford facilities for producing plate and bar iron, though the principal finished product of the Byers company is wrought-iron pipe and for some time output is expected to be confined to this product.

The Girard, O., hand-puddle mill of the Byers company was closed Aug. 15. The Girard plant, with a capacity of 5000 tons a month, formerly was the largest single unit of hand-puddle furnaces in the country. It was built in 1908 and, in addition to 88 puddle furnaces and plate mills, included a blast furnace which was dismantled in 1929.

Exports in June of pneumatic portable tools from the United States totaled 1563 units, approximately one-third of which were sold to the United Kingdom.

Sheet Sales Reduced in August; Auto Output Tumbles to Year's Low

DAILY average sheet sales by independent mills dropped to 4821 tons in August from 6690 tons in July. Production decreased to 5611 tons from 6007 tons in July. Shipments increased to 6638 tons, from 6282 tons. Total sales for August were only 53 per cent of those in August last year; production was only 40 per cent, and shipments 56 per cent. National Association of Flat Rolled Steel Manufacturers reports as follows:

	Net tons	Per cent of capacity
Total sales for August	148,969	41.0
Total production	173,956	48.6
Total shipments	205,774	57.5
Unfilled tonnage as of Sept. 1	373,148	104.3
Approximate finished stock on hand awaiting shipments	99,925	27.9
Approximate in stock, unsold	82,315	23.0

The total sheet capacity of the United States for the month of August, 1930, was approximately 529,600 net tons. The capacity on which the above figures are based is 358,000 net tons.

A comparison of monthly totals follows:

	Sales	Production	Shipments
June, 1929	307,911	337,841	347,989
July	337,222	323,905	344,676
August	282,107	366,734	365,649
September	274,568	302,490	301,330
October	258,810	319,660	291,135
November	134,391	204,071	207,200
December	234,599	181,916	178,575
January, 1930	382,122	291,529	241,677
February	203,315	275,952	241,441
March	299,764	259,658	275,235
April	300,086	308,988	291,601
May	204,589	274,220	266,436
June	137,412	205,675	212,930
July	207,400	186,206	194,767
August	148,969	173,956	205,774

August Boiler Orders Hold

New orders for 1371 steel boilers were placed in August by report of 81 manufacturers to the department of commerce. August's orders had an area of 1,356,751 square feet, compared to July's new orders of 1,410,096 square feet embodying 1309 units. Square footage for eight months is 10,039,605 for 1930, contrasted with 13,600,290 in 1929.

Autos Low Since December

Production of automobiles in August declined to 223,046 passenger cars and trucks in the United States, the lowest point since December, 1929, according to the department of commerce. For eight months, output totals 2,704,957 units, or 1,500,000 behind last year's record. Comparisons follow:

	United States		
1929	Total	Passenger cars	Trucks
Aug.	498,628	440,780	56,808
(8 mos.)	4,224,911	3,629,021	583,163
Sept.	415,120	363,471	51,576
Oct.	380,017	318,462	60,687
Nov.	217,573	167,846	48,081
Dec.	120,007	91,011	27,513
(Year)	5,358,420	4,569,811	771,020
1930			
Jan.	275,374	236,145	38,657
Feb.	346,940	296,461	49,457
March	401,313	335,720	64,204
April	443,038	374,913	67,560
May	417,406	362,522	54,370
June	335,477	289,245	45,773
July	262,363	222,459	39,663
Aug.	223,046	187,037	35,758
(8 mos.)	2,704,957	2,304,502	395,442

Sales of Stokers Slump

After the high monthly sales rate of June and July, mechanical stokers fell off in August to 115 units. While still the third highest month of the year, August's total is considerably under the 199 stokers sold in August, 1929, from reports following made by 11 manufacturers to the department of commerce:

1929	Stokers sold	Fire tube boilers	Water tube boilers
August	199	94	105
Total (8 mos.)	1,197	473	724
September	155	71	84
October	178	89	89
November	107	43	64
December	79	30	49
Total (year)	1,716	706	1,010
1930			
January	53	24	29
February	73	26	47
March	89	45	44
April	108	46	62
May	96	41	55
June	151	70	81
July	150	83	67
August	115	61	54
Total (8 mos.)	835	396	439

Gray Iron Sentiment Up

August production of 159 foundries reporting to the Gray Iron institute, Cleveland, was 62.8 per cent of normal, which is the average monthly output during the past three years. This is an 0.8 per cent drop from July but contrasts with the 123 per cent production percentage of August, 1929.

New business was 2 per cent more than July; unfilled orders 16 per cent greater; material on hand, 18 per cent less. Further indication of revival is in 62 of 132 reporting members saying business was fair; 52 poor; 15 bad, and three good. This shows a better condition than the report of July.

Steel Barrels Fall For Fifth Successive Month

Production of steel barrels in August fell from July's 44 per cent operating capacity to 39.6 per cent. Shipments also were off and immediate unfilled orders suffered a severe decline. Reports following are by the department of commerce from 27 companies:

1929	Production	Shipments	Unfilled orders within 30 days
Aug.	806,574	809,860	358,150
(8 mos.)	5,847,773	5,837,538	.....
Sept.	663,531	653,890	302,632
Oct.	629,976	638,681	298,550
Nov.	572,621	567,257	285,295
Dec.	624,365	618,003	294,797
Total, (year)	8,338,266	8,315,369	.....
1930			
Jan.	650,764	643,120	304,354
Feb.	648,709	643,324	313,349
March	842,186	856,451	452,933
April	769,061	766,617	322,161
May	731,087	736,147	393,843
June	651,559	638,358	319,754
July*	617,420	621,091	311,630
Aug.	553,842	552,265	237,745
(8 mos.)	5,464,628	5,457,373	.....

*Revised.

August River Tonnage Off

River shipments of iron and steel products in the Pittsburgh district declined sharply during August. The combined tonnage for the first eight months of this year, however, still is ahead of the corresponding 1929 period. Comparative monthly figures follow:

1929	Allegheny	Monongahela	Ohio
August	100	134,426	137,734
(8 mos.)	1,607	804,428	777,724
Sept.	.....	135,773	150,163
Oct.	.....	119,380	119,129
Nov.	500	83,189	88,011
Dec.	400	60,957	77,885
Total	2,507	1,203,827	1,212,912
1930			
Jan.	100	58,784	64,736
Feb.	210	80,327	74,385
March	100	111,702	109,911
April	1,000	70,229	66,482
May	.....	117,942	128,502
June	700	137,603	144,099
July	1,125	132,161	147,558
August	2,600	96,498	107,948
(8 mos.)	5,835	805,246	843,621

Price Index Slightly Lower

August wholesale price index for iron and steel was 90.1, compared

(*Concluded on Page* 97)

Merger Testimony Ending, After Three Months

TESTIMONY in the Bethlehem-Sheet & Tube merger case is likely to be closed by Thursday this week, three months from the starting day, June 25. Under steady prodding by Judge David G. Jenkins in the court of common pleas, Youngstown, O., lawyers on both sides are rushing in the last bits of oral and documentary evidence. Frank Purnell, Sheet & Tube president, and W. M. McDonald, the company's controller, were cross-examined Tuesday, telling of the company's endeavors in February to figure out ratios of stock exchange with Bethlehem.

Cross-examination of Cyrus S. Eaton, merger opponent, closed Monday. Pro-merger counsel introduced news reports describing the ambitious plans of Continental Shares, Inc., an Eaton interest, for mergers of midwestern steel companies. While Mr. Eaton could not identify some of them, a mimeographed copy was finally introduced with the caption: "From Continental Shares, Inc., Cleveland. For immediate release."

Three of the principals in the merger negotiations successively occupied the witness stand last week. Samuel Mather, senior partner in Pickands, Mather & Co., and important shareholder in both Bethlehem and Sheet & Tube, told details of merger meetings all Thursday afternoon. Previously, H. G. Dalton, his partner, described some of the inner workings of the negotiations. Friday was devoted entirely to testimony by Mr. Eaton.

First Time on a Witness Stand

Mr. Mather appeared for the first time in court as a witness. He began by tracing his interest financially in Sheet & Tube, starting in 1902 when he bought his first share of stock in the company. Previously his firm had sold Lake Superior iron ore to Sheet & Tube. His holdings in that company on the record date of March 22, 1930, reached a total of 60,000 shares, and at the same time he held 20,000 shares in Bethlehem.

The witness testified he had first favored merging the Youngstown company with Inland Steel. He learned of the proposal to merge with Bethlehem Feb. 28 when he and his brother, William G. Mather, went to New York to sail for a trip to the West Indies. Mr. Dalton and James A. Campbell, Sheet & Tube chairman, met him and told of the plan to merge with Bethlehem. Later when they returned, Mr. Dalton and Mr. Campbell wanted to know what the brothers thought of the plan before further steps were taken. Samuel Mather said he was favorable to it, and his brother thought well of it as presented by Mr. Dalton, but would not commit the Cliffs Corp. until he had consulted his partner, Mr. Eaton.

Mr. Mather on the stand told of the March 7 meeting in Cleveland when Mr. Dalton first told Mr. Eaton of the Bethlehem plan. The witness said he was "surprised and amazed" to learn then from Mr. Eaton that the latter thought unfavorably of the project. Mr. Eaton's language left no doubt in the mind of the witness that he was strongly opposed to it. Hence another meeting was called for March 11 when Mr. Eaton could have the matter explained to him by Sheet & Tube and Bethlehem officials and by Price, Waterhouse & Co. auditors..

At this meeting Mr. Eaton again expressed strong opposition to the merger plans, suggesting a better deal might be made with Inland Steel. Finally, Mr. Mather said he turned to Mr. Campbell and said he thought the latter had ample reason for not delaying the meeting of Sheet & Tube directors, set for the following day for voting on the merger terms. All through this meeting, Mr. Eaton asked for further delay by the directors until the merger terms could be gone into more fully. The witness testified that at the February meeting in New York he had told Mr. Campbell that he would rely on his judgment in the merger matter and would back him to the best of his ability, not knowing that the Inland plan was off, but expressing his own preference for merger with Bethlehem.

Mr. Eaton was subjected to a vigorous cross-examination by Newton D. Baker following Mr. Mather's testimony. He told why he opposed the Bethlehem proposal, declaring it was too favorable to Bethlehem which he said is a "high-cost" producer of steel. He believed that Bethlehem's plants are not well located geographically for expansion in the steel trade. He questioned the judgment of Sheet & Tube officials as to structural and rail mills, while paying them a compliment for what they already had accomplished with their plants. He suggested an alliance with Inand would be preferable because Inland has a flexible shape and rail mill ready to supply the expanding markets of the Middle West.

Mr. Eaton said he thought the New York demand for structural steel has passed its zenith and he favored leaving the market of the East to Bethlehem where competition with United States Steel Corp. mills in the Pittsburgh district will become stronger. He went into an explanation of the results on the steel industry of the abolition in 1923 of "Pittsburgh plus," declaring it made for a bad situation for Bethlehem, but he thought recent decisions of the interstate commerce commission have been favorable to the Youngstown district.

The date for consummation of the proposed merger has been extended 30 days more, from Oct. 31.

J. & L. Plans New Bar Mill

Jones & Laughlin Steel Corp., Pittsburgh, announces that 40 per cent of the $21,000,000 sum set apart for plant improvements is being or will be expended on works in the immediate Pittsburgh district. Excavation work has started on a new bar mill at the site of the old beehive coke ovens in the Hazlewood district. This mill will have an annual capacity of 250,000 tons of bars in sizes of from 1 to 3-inch. A new boiler and power plant is being built in the Eliza furnace group and will represent the expenditure of several million dollars. Other sums are to be spent at the Aliquippa works and at iron ore and coal mines, stone quarries and other subsidiaries.

Center Republic Alloy Sales at Massillon

Norris J. Clarke, vice president in charge of sales of the Republic Steel Corp., has announced that effective Sept. 29, the alloy sales division of the corporation, in charge of J. M. Schlendorf, general manager of alloy sales, will be located at Massillon, O. Since the organization of the corporation early in the year, alloy sales have been directed from headquarters at Youngstown, O. The corporation's manufacture of alloy steels is largely centralized at the Central Alloy plants in Massillon and Canton.

Operate Electric Pipe Mill

Youngstown, O. —The new electric pipe welding mill of Youngstown Sheet & Tube Co. is now in regular operation, with output and operation entirely satisfying officials. The mill is well provided with orders. Large orders for seamless tubing obtained recently by Sheet & Tube indicate that when the large pilger mill will be ready after extensive rebuilding, this unit will have a long run.

Industrial Men in the Day's News

C. A. McCune, Director of Research, Welding Engineering & Research Corp.

IDENTIFIED with the welding industry for 25 years or more, he has specialized in welding wire and has invented numerous devices, including acetylene gas tanks.

HE has been with American Chain Co. and affiliated interests for more than 14 years, latterly as director of research at Bridgeport, Conn.

ONE of the founders of the American Welding society, he has been its treasurer since 1923, and likewise has served on numerous committees.

INTERESTED in welding, welding methods and welding research for 25 years or more, C. A. McCune was elected director of research and member of the board of directors of the recently organized Welding Engineering Research Corp., 25 West Forty-third street, New York, as noted in STEEL of Sept. 18. For about 14 years previously he had been with the American Chain Co., Bridgeport, Conn., and its affiliated interest, Page Steel & Wire Co. The new company will devote its efforts to industrial and scientific welding research and engineering and the services of those who comprise it will be available for consultation on all welding problems.

Mr. McCune is considered one of the early technical pioneers of welding. In 1905 he was assistant engineer and later chief engineer of the Commercial Acetylene Co., New York, where he successfully assisted in developing cylinders for the safe storage of acetylene gas. He has invented other devices used in the manufacture of acetylene and in its application to lighting and welding, one invention making possible the lighting of railway passenger cars by the acetylene mantle system.

In 1916 he became affiliated with the Page Steel & Wire Co., 30 Church street, New York, actively continuing his earlier investigations of welding wire, and assisting in the sale and servicing of welding rods. When in 1920 control in this company passed to American Chain Co., Bridgeport, Conn., he became director of research, remaining until his recent resignation. While with the Page company he was a member of the Emergency Fleet welding committee and was chiefly responsible for the development of specifications for welding wire.

Mr. McCune was one of the founders of the American Welding society and since 1919 has served as chairman of the welding wire specifications committee, American Bureau of Welding. He was elected president in 1922 and at present is its treasurer, having held that office continuously since 1923. He is a member of the organization's Miller memorial award board. He also is president of the International Acetylene association, and for two years served as chairman of the Morehead medal award board and as chairman of the acetylene development committee.

He is a member of the National Research council, Advisory Board of the United States bureau of standards, American Society of Mechanical Engineers, British Institute of Metals and American Society for Testing Materials. He also is chairman of the welding committee, Chicago world's fair exposition in 1933. He has made a number of contributions of technical articles, dealing particularly with the properties and metallurgy of welding wire and has assisted in the preparation of textbooks on welding.

W. G. BUCHANAN, formerly connected with Trumbull Steel Co., Warren, O., now a part of Republic Steel Corp., Youngstown, O., has been appointed vice president and assistant general manager, Keystone Steel & Wire Co., Peoria, Ill. About a year ago Mr. Buchanan became affiliated with the Keystone company as assistant to the president. He is widely known because of his financial and investment work with Floyd A. Beahl & Associates, instrumental in arranging various mergers such as Empire Steel, Mid-States Steel & Wire, and others.

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Henry Harnischfeger, president, Harnischfeger Corp., Milwaukee, manufacturing cranes and construction equipment, has returned from a 3-month visit to his native city, Salmuenster, Hessen-Nassau, Germany. While there he laid the cornerstone of a new public school made possible by his liberal gifts.

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Charles A. Gutenkunst, formerly vice president and secretary, Milwaukee Malleable & Grey Iron Works, Milwaukee, has been elected president and treasurer to succeed the late William Gutenkunst, whose death was noted in STEEL of Sept. 4.

E. W. Gutenkunst has been elected

vice president, and C. A. Gutenkunst Jr. secretary. Frank W. Fellenz, president, Fellenz Coal & Dock Co., Milwaukee, has been added to the board of directors.

These officers and directors also have been elected officers and directors of Milwaukee Hay Tool Co., Milwaukee, an affiliate of Milwaukee Malleable & Grey Iron Works.

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Jerry J. Tobias, former vice president, Moto-Meter Co., Detroit, has been appointed assistant sales manager, Federal Steel Corp., Detroit.

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Elias Mayer has resigned as president, General American Tank Car Corp., Chicago, effective Oct. 1, owing to his desire to be relieved from active duties. He plans to take a vacation of several months in Europe.

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H. R. Rowland, division manager at Philadelphia, A. M. Byers Co., Pittsburgh, is being transferred to Pittsburgh as division manager, effective Oct. 1. E. L. MacWhorter, representing A. M. Byers Co. in western New York, will succeed Mr. Rowland at Philadelphia.

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S. R. Elliott, general manager, Cleveland-Cliffs Iron Co., Ishpeming, Mich., since March, 1928, previously having been general superintendent of its iron ore mines, was elected president of Lake Superior Mining institute for the ensuing year at the Sept. 10 meeting at Duluth.

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George Hansell, who resigned recently as general superintendent of Ashland, Ky., plants, American Rolling Mill Co., Middletown, O., has been appointed general superintendent of mills and mines, Gulf States Steel Co., Birmingham, Ala. He will relieve L. E. Geohegan, vice president and general manager, of much technical detail work.

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Burton L. Verner, until recently purchasing agent of Interstate Iro & Steel Co., Chicago, now a part of Republic Steel Corp., has become associated with M. S. Kaplan Co., Chicago, dealer in iron and steel scrap, railway equipment, etc. Mr. Verner formerly was president of the Purchasing Agents' association of Chicago.

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Charles A. Lynch, formerly manager of sales and engineering, Fort Pitt Steel Casting Co., McKeesport, Pa., has been appointed vice president and general manager, the Foote Co. Inc., Nunda, N. Y., builder of concrete mixers. Mr. Lynch has been identified with the steel castings industry for 23 years, the past 11 with the Fort Pitt company. He received his first training in this line with American Steel Foundries at the Thurlow, Pa., plant, the employ of which he entered in 1907. Six years later he joined the Taylor-Wharton Iron & Steel Co., spending several years with this company at Philadelphia. Upon the entry of the United States in the World war Mr. Lynch went to Pittsburgh in charge of government inspection and procurement of steel castings for ordnance work west of Philadelphia. At the termination of the war he joined the Fort Pitt Steel Casting Co.

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John J. Cone, president, Robert W. Hunt Co., Chicago, engineers, and a member of that organization since it was organized in 1888, has retired.

C. B. Nolte, vice president and general manager, has been elected president and general manager, with headquarters at the general office, Chicago.

J. C. Ogden, director and eastern manager, has been elected vice president with headquarters at 53 Park place, New York.

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R. A. Russell has become affiliated with Rustless Iron Corp. of America, 122 East Forty-second street, New York, as vice president in charge of sales. Mr. Russell formerly was with Continental Can Co. and later organized and controlled the Paragon Can & Cap Co., Paterson, N. J. When the latter company was merged with the Anchor Cap Corp. in Long Island City, N. Y., Mr. Russell became vice president of the Anchor corporation.

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J. Ralph Patterson, formerly manager of Adamite and alloy sales for Mackintosh-Hemphill Co., Pittsburgh, has been elected manager of roll and alloy sales, combining these two departments, following the resignation of Fred Griffiths, formerly manager of roll sales. Mr. Patterson was born in Beaver, Pa., Feb. 12, 1895. His first connection was with Pittsburgh Crucible Steel Co., Midland, Pa., in the civil engineering and construction department. After two years he was employed for a year in the construction department of Jones & Laughlin Steel Corp., Aliquippa works, during the building of its tube mills.

In 1916 he became affiliated with the Pittsburgh Iron & Steel Foundries Co., in charge of engineering and estimating departments, which position he held until 1922, when the company was absorbed by Mackintosh-Hemphill Co. During this foundry connection Mr. Patterson became familiar with the entire plant, gaining valuable knowledge regarding foundry practice, metallurgy, and the proper applications of alloy, iron, and steel castings in the rolling mill field. This knowledge covers not only Adamite and alloy castings, but also rolls and rolling mill castings. In 1922 he was appointed assistant manager of Adamite and alloy sales and four years later, in 1926, he was appointed manager. On Sept. 8, 1930, he became manager of the roll and alloy sales department.

Obituaries

HENRY PHIPPS, 91, philanthropist and former associate of Andrew Carnegie, retired since the formation of the United States Steel Corp., died Sept. 22 on his Bonnie Brink estate, Great Neck, Long Island, N. Y. Mr. Phipps relinquished most of his business responsibilities early in this century, at which time his steel holdings were estimated at $75,000,000. He has contributed many millions to the establishment of medical centers and other welfare work.

Mr. Phipps was born in Philadelphia Sept. 27, 1839, and received his education in public schools of Allegheny, Pa., where he moved with his parents in early youth. His first connection with the steel industry was as office boy for Dilworth & Bidwell, Pittsburgh, spike manufacturers. He became bookkeeper and when the partnership dissolved in 1861 he became parner to Mr. Bidwell in the powder business.

Two years previously, however, he started to keep books at night for Kloman & Co., operating a small forge and blacksmith shop in Duquesne, Pa. By 1861 the firm was known as Kloman & Phipps and a small iron mill at Twenty-ninth street, Pittsburgh, was acquired. Two years later Andrew Carnegie's brother joined the firm and in 1865, Andrew Carnegie followed, purchasing a 40 per cent interest. The combination became Union Iron Mills Co.

In 1872 it established Lucy furnace, Pittsburgh, and the organizations which followed were successively known as the Carnegie, Phipps Co., Carnegie Bros., and finally Carnegie Steel Co. When these properties were acquired by the Steel Corporation, both Messrs. Carnegie and Phipps retired.

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Caspar Mettler, 60, president, Mettler Machine Co., New Haven, Conn., died Sept. 15 of a heart attack.

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William C. Howe, for many years sales engineer of the Eastern Bridge & Structural Co., Worcester, Mass., died last week.

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John Leonard Esson, 52, vice president, Ford, Bacon & Davis Inc., 39 Broadway, New York, consulting engineer, died Sept. 21.

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James E. Millar, general manager, Ingalls Iron Works Co., Birmingham, Ala., died at his home in that city, Sept. 16.

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Harry Kienzel, 51, member of the Philadelphia sales force,, Jones & Laughlin Steel Corp., Pittsburgh, for the past 25 years, died Sept. 7, after a long illness. Mr. Kienzel was particularly well known among

(*Concluded on Page* 31)

Here and There in Industry

NATIONAL FOUNDRY CO., and Quality Stove & Range Co., affiliated firms, St. Louis, have completed arrangements for purchasing the abandoned National Carbon Co. plant at Belleville, Ill. The plant of the stove company was recently burned, with the exception of one building, with damage estimated at $500,000. The Carbon company plant was abandoned a year ago when manufacturing quarters were transferred to several eastern cities. It comprises 22 buildings with about 100,000 square feet of floor space. Buildings are of steel construction, with adequate switching facilities.

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Clark Controller Co., Cleveland, tenant in its present plant at 1146 East 152nd street for the past five years, has acquired title to its plant through exercise of option.

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Teletype Corp., Chicago, manufacturer of printing telegraph equipment, has been sold to the American Telephone & Telegraph Co., New York, and will be operated as a subsidiary of the Western Electric Co., Chicago.

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Industrial Heating & Engineering Co., Milwaukee, will install four 200 horsepower water tube boilers, two 125-kilowatt and one 50-kilowatt steam engine driven generator sets and switchboard for the United States naval depot, Melville, R. I., at a cost of $91,000.

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Nordberg Mfg. Co., Milwaukee, has added to its payroll, making the total at work over 1000, which is 15 per cent more than a year ago. Business on the books is sufficient to assure continued night and day operation for the remainder of the year. Company makes large diesel engines, mining equipment, stone crushers, compressors and other heavy duty machinery.

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Barnett Foundry & Machine Co., Irvington, N. J., has a contract with G. & J. Weir Ltd., Glasgow, Scotland, for the manufacture and sale in this country of feed regulators, pumps and other products of the Contra-Flo Co., London, England, G. & J. Weir Ltd. hold the patents which were held in this country by Bethlehem Steel Co.

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Edgar E. Brosius Inc., Pittsburgh, has received orders for two hydro-electric clay guns for the Lackawanna plant of the Bethlehem Steel Co., one for the South works of the Illinois Steel Co., Chicago; one for the Ohio works, one for the Edgar Thomson works, and one for Carrie furnaces, all of the Carnegie Steel Co.

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Shaler Co., Waupun, Wis., has completed enlargement of its golf club manufacturing department and is adding 25 employes. Production is being increased 100 per cent, with daily output of 1000 clubs. The increase is due not only to the heavy sale of clubs to operators of miniature golf courses, but to the excellent prospects for the 1931 outdoor golf season.

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American Foundry Co., 1535 Naomi street, Indianapolis, will reopen not later than Nov. 1, according to Blaine H. Miller, president. The plant of the company was destroyed by fire recently with a loss of $750,000. A new plant has been constructed which includes eight buildings with a total floor space of 120,000 square feet. The largest building is the cleaning room which is 100 x 300 feet.

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Carnegie Steel Co., Pittsburgh, has ordered from the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., ten motors for installation in its McDonald, O., works, all of which are for the operation of a new 12-stand 10-inch bar mill. Two of the 800-horsepower motors are vertical and are to be mounted above the mill itself. The new mill is especially interesting in that it is the first to use vertical main rolls and main roll motors, the purpose being to eliminate the necessity of twisting the hot steel in the rolls.

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Ulster County Foundry Corp., 20-40 St. James street, Poughkeepsie, N. Y., this year completes its first hundred years, and will begin the second with a reconstructed plant, doubling its capacity. The building will be strengthened to permit the installation of a 5-ton crane and modern machinery, which will give the company a wide scope for machining. According to E. M. Hicks, vice president and general manager, the production of a new line of equipment, complete from casting to machining, will be undertaken. E. H. Mayes, of New York, where the company has an office at 50 Church street, is president. At present 22 men are employed.

Obituaries

(*Concluded from Page* 30)

steel consumers in the anthracite coal mining districts, in eastern Pennsylvania.

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Charles C. Coventry, 65, president and founder of Cleveland Tool & Supply Co., Cleveland, died Sept. 18 at his home in Cleveland Heights, O. Born in New Philadelphia, O., he has been active in Cleveland industry for 35 years. He organized the Cleveland Tool & Supply Co. 33 years ago.

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James E. Evans, S. Obermayer Co., Chicago, foundry equipment and supplies, died Sept. 17 after a brief illness. Mr. Evans was connected with the Obermayer company for almost 40 years and was especially well known in the Chicago territory where he represented the company for a considerable time.

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Frederick Guilfoyl, for many years superintendent, American Brake Co., St. Louis, subsidiary of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., died recently. Mr. Guilfoyl went to St. Louis 25 years ago from Pittsburgh to become superintendent of the brake company. Previously he had been associated with other Westinghouse companies.

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George F. Porter, 67, for several years chief engineer, Canadian Bridge Co., Walkerville, Ont., died Sept. 20 in Detroit, his birthplace. Mr. Porter in 1900 helped organize the Canadian Bridge Co. In 1909 he joined the staff of the board of engineers appointed by the dominion government to design and supervise construction of a bridge across the St. Lawrence river at Quebec. He remained in charge of the drafting department until the official design was completed, and organized a staff to supervise its fabrication and erection.

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Frank Richards Ford, 58, member of Ford, Bacon & Davis, 39 Broadway, New York, consulting engineers, died Sept. 17. He had been a leader in industrial and public utility engineering more than 30 years. Born in Philadelphia, he was graduated in 1890 from the University of Pennsylvania with a B. S. degree and four years later became a partner in the company that now bears his name. As consultant, Mr. Ford was associated with L. C. Smith & Corona Typewriters Inc., the Lackawanna & Wyoming Railroad Co., Syracuse Washington Machine Corp., Benedict Stone Corp., Oswego Falls Corp., Onandaga Silk Co., Fokker Aircraft Corp., and others. He was a member of numerous business and social organizations, including the American Railway association, Railroad club, New York, and Union League club, Philadelphia.

Wesley Bowman Studio

Steel Angles from Chicago

CHICAGO

HOPE for brighter prospects soon in the western steel markets comes in part from the fact that customers' shelves are virtually barren. Whether even a moderate upturn would bestir a rising market is being discussed.

Three months ago it appeared farm implements and tractors would be a chief means of speeding business recovery in the West. Since then, scenes have shifted. Surplus wheat plus the drought have largely removed the farm equipment works from the picture for the time being. Now the railroads, while as yet giving no tangible signs, are being picked as the autumn's hope in steel tonnage.

Spring's Work Now Cleaned Up by Freight Car Shops

Western freight car shops have been idling for more than six weeks on finishing touches to last spring's orders and on minor car repair work. Pullman Car & Mfg. Corp. at its Michigan City, Ind., works has assembled the 1500 cars for Chesapeake & Ohio and now is engaged with small repair jobs. Standard Steel Car Co.'s works also is completing its order for the same road.

Pressed Steel Car Co. likewise has completed work for the Van Sweringen lines, and recently booked an order from the Mexican railways for 100 box cars and 15 flats—a drop in the bucket in relation to its capacity. American Car & Foundry Co.'s Chicago works has been down since late July, and its two plants in the St. Louis district are virtually idle.

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Bettendorf Co., Bettendorf, Iowa, has held out longer on the season's program than a number of the builders. That company has finished 100 underframes for the Union Pacific, and is nearly ready for delivery on the several hundred cars it has been building for the Green Bay & Western. A fairly satisfactory year is reported by Bettendorf, despite the almost entire lack of important car buying since early in the spring.

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General American Tank Car Corp. here still has some work on hand, due to its building and leasing arrangements. The company's shops in the Calumet district are completing the 500 stock cars for lease to the St. Paul road, and 500 for Minneapolis & St. Louis.

In the meantime, through its European subsidiaries, General American has developed a new type of "automatic" refrigerated car, which is said to create a proper temperature in the car for more than a week. Active marketing is expected soon on the continent.

Chicago district rail mills are poised for news as to 1931 rail buying. Only one inquiry is in sight now. Usually, indications are manifest by about Sept. 15. It is probabe no definite signs will appear this year at least before about mid-October. It is thought the atmosphere will be cleared by that time, and, with the increasing car loadings, the roads may be able to release some of the tension on their retrenchment policies.

Fastenings' Market Mirrors Heavy Track Repairs

Miscellaneous rail shopping by the western roads is bringing in a light flow of rail tonnage each week, while track fastenings, on the other hand, actually are of enough importance to meet seasonal expectations. The frequent placement of small rail orders lately has been due to the unusual amount of track repair work being done this year by western carriers.

Steps for the refinement of railroad passenger cars on the transcontinental lines are interesting the steel mills, particularly the makers of alloy and special steels. De luxe ideas in passenger car building steadily are becoming more marked.

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Critics who have studied American and European passenger equipment and trains say that car for car the American parlor car is far ahead of its European compeer. But they point out that the local train is the step-child of the American railroad, and should be improved.

In England and other European points, there are no trains to compare, except in speed, with the American crack limiteds, such as the Chief, Golden Gate, Capitol and Knickerbocker limiteds, but local trains and equipment rate much higher.

Stress on Style Creeps into Railroad «Specials»

Gratifying to the maker of special steels are the numerous instances recently of the "dressing up" of passenger rolling stock by the car builders. Western roads this summer inaugurated the de luxe air-cooled diner. The International limited of the Grand Trunk-Canadian National now carries an 87-foot steel dining car, with individual dining compartments, the longest diner ever built. In the last year, several roads have completed the adoption of automatic heat regulation.

Chicago & North Western has the new composite Pullmans on one of its Northwest specials. These cars embody new principles of passenger car construction, having three side

entrances, permitting direct access to the middle of the cars, and rubber insets to absorb shocks. Diaphragms at the ends of the cars are spring-hung from the top instead of being anchored to the ends, designed thus to eliminate rattling. Interiors are standard sleeping sections, drawing room and three special bedrooms. Cafe-limousine observation cars are taking on more refinements. The Advance Twentieth Century of the New York Central now has single bedroom-lounge cars, and Baltimore & Ohio's new type single bedroom sleepers are a new type passenger equipment. Special parlors recently were installed by Chicago & North Western for one of its Colorado specials. Burlington has completed the work of replacing its remaining wooden coaches with steel cars. Cost of the replacement has been $2,000,000, and the work has required about two years. That road also now operates 57 gas-electric engines on branch lines throughout its system.

«One Man's Meat Is Another Man's Poison»

Turn of events in the farm equipment field has disappointed eastern steel makers. Crop news is far from cheerful. Wheat, which has been moving erratically in price, bears no prospect of important advances.

United States government report on corn shows the lowest total in about 30 years, but this is discounted by the expected continuation of high prices. It is indicated that the farmer is not unduly alarmed, but the drought and low wheat prices have thrown awry the autumn plans of the implement makers, and some say the year, coincident with viewpoints in the automobile industry, might as well be written off as far as implement sales are concerned.

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Despite the gloom, fair specifications of steel for certain types of implements are likely later this year. The regular autumn tillage tool line, however, probably will be light.

Implement makers and dealers are using the poor corn crop in helping to map sales campaigns by pushing equipment for salvaging, as forage, that portion of the corn crop that cannot be husked with profit. Thus sales of crop-saving machines, including ensilage cutters, shredders and feed grinders, may grow proportionately heavier.

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Western tractor plants are on slow schedules. All have been hard hit by adverse crop sentiment. The three Russian orders for tractors placed in this district created only a passing flurry in operating schedules, as it developed that the plants receiving the orders could have shipped a large portion from stocks.

The extent to which the foreign markets this year stimulated tractor works consumption of steel is indicated by the recent announcement of the United States department of commerce that a new high record in tractor exports was established in the first six months this year. Russia was the leading market. During first half, 35,790 tractors, valued at $40,537,650 were exported, compared with 34,666, valued at $32,996,220, the first six months of 1929. Exports to Russia were valued at $21,715,867, a new high record, compared with $4,300,000 in the first half of 1929. More Russian tractor orders are forthcoming for shipment early next year.

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Tin plate production is not being affected as seriously by the drought as had been expected. Requirements of canners for the corn and late vegetable packs are such that can makers in this district are operating day and night shifts. Saturday and other holiday operations have been continued. Nearly 900 cars of packers' cans were shipped from the Chicago plants of one company during a recent seven-day period.

Chicago warehouses are empty, hence the close-range demand. Early season demand was light, however. The season's crop of peas, chiefly from the Wisconsin area, was so light that the pack only was 30 to 40 per cent of normal. The corn pack will be off from normal years, but the declines are being countered by increased packs of other late crops.

Boat Shipments Cut Into Chicago Pig Iron Market

Most of the season's shipments of eastern pig iron by lake boat to the Chicago-Milwaukee area apparently have passed, but the potential effects of eastern iron on the docks may have further influence on the local furnace market.

Indicative of the influence of boat shipments was the decline in successive stages of 50 cents a ton each from $20 to $17.50 during the navigation season. Sale of base furnace iron below $16.75, Chicago, was made direct by a steelworks furnace as a result of the sharp competition. A single factor prevented a much heavier movement of boat iron this season. A farm equipment maker just north of the Chicago district, always in the market for eastern iron shipped by boat, cut down his foundry operations sharply in the height of the shipping season.

Ordinarily consuming about 2000 tons monthly, this melter pared down his requirements to only about 100 tons monthly. With that melter a light buyer this year, a surplus of boat iron was available for general marketing at all times. This offered the sharpest competition with local furnace iron in years. For the first time, boat iron shipments presented a forceful wedge in the pressure against Chicago district pig iron prices. As autumn approaches, a more definite general inquiry is developed. The influence of boat iron remains and is likely to continue this year as long as the present tonnage at the docks is sufficient to meet demands of good-sized requirements. Little of the base grades remains at the docks, however.

Great Lakes Shipping Grows in Chicago District

Prestige of the Chicago district as a Great Lakes shipping point is being enhanced to an important extent by growing shipments of steel products by water. This tonnage, added to the movement of the raw materials for the making of steel and iron, overshadows gains in other products handled at the Chicago area ports.

Figures for 1929, just released by the United States engineer's office here, show that the port of Chicago, which embraces the shore line from the north edge of the loop to Grant Park, the Chicago river, drainage canal and Calumet harbor, recorded a loss of about 300,000 tons from 1928, while Gary gained 1,600,000 tons and Indiana Harbor about 600,000 tons, the latter two ports of the Chicago area being steel producing sites. Several of the lesser ports in the area also gained, but less strikingly.

Gary received 6,500,000 tons of iron ore for its steel-making last year, and 865,000 tons of coal. Indiana Harbor's receipts of ore totaled 3,370,000 tons, while 1,669,000 tons of coal were unloaded.

Surplus Stock Withdrawn

Washington—War department has rejected all bids on its surplus stock of bolts, nuts and rivets, stored at Jeffersonville, Ind., and on which bids were opened Sept. 9. The stock included 16,000,000 pieces, totaling 3500 tons. There was criticism of the policy of offering its large stock at a time when business was slow.

Institute Meets Oct. 24

New York—The fall meeting of the American Iron and Steel institute will be held here Oct. 24 at the Hotel Commodore, it has been officially announced.

EDITORIAL

Trade Co-operation Wins When Price Agreements Fail

RECENT experiences of steelmakers in this country and in Europe show that much more can be accomplished sometimes by mutual understanding of a problem and voluntary co-operation for its solution than by oral or written agreements. President Hoover once said that self-regulation by an industry is preferable to regulation by laws, to which might be added that self-control in regard to prices is better than an attempt at artificial control by group pledge and action. Witness what has transpired here and in Europe in the past year.

In this country there were no cartels or selling syndicates in the steel industry fixing and endeavoring to maintain fixed prices. The nearest approach to group action was suggested by James A. Farrell when he said to the American Iron and Steel institute in May that the industry should not sell its products at a loss and make it up by reducing wages. That this had nothing to do with price fixing is evident from the fact that the secretary of labor, James J. Davis, speaking recently to the Steel Founders' Society of America, emphasized the same statement.

The result of co-operation by the steelmakers in such a policy has been beneficial to the industry and to the country. For while prices have yielded, as might have been expected, the recession has been orderly and gradual; the change has come by easy stages, not with a crash. The industry has not upset itself in a vain drive for business, nor has it created in this country a major social problem threatening to overthrow the government.

Entente Fails To Control Prices

In Europe the most strongly organized effort ever made anywhere to fix and control prices, with government sanction, has failed; and the result apparently is more unsatisfactory than if there had been no "binding" agreements. The longer the steelmakers succeeded in maintaining artificial price levels in a period of depression the more precipitate and drastic was the inevitable reaction.

The agreements between the German, French, Belgian and Luxemburg steelmakers did not have as much force as the general understanding by Americans against ruthless competition and the punishment of labor. A price war has prevailed in Europe since early summer; there have been wage reductions and severe hardships for industries and their employed and unemployed personnel. The recovery will be slower than in this country.

The European steel entente has decided to carry on, but its effectiveness as a price-fixing and stabilizing body is questionable. The sequence of events has shown that the entente itself, whose sole object originally was to control production, is not sufficiently armed against cut-throat competition in lean times.

Desire for Unity Continues Strong

It becomes apparent that when times are prosperous the want of organization to control trade and production is not felt. When reaction begins to intervene, followed by a period of sluggish trade, then measures are taken in the hope of applying a brake to the fall of prices. But when a serious crisis arises the weaker members of the team lose faith, or a few of the stronger members attempt to take advantage of the situation, and the whole organization becomes disrupted. Failure is made easier when the controlling plan is unwieldy and complicated, as was the case concerning the entente and its comptoirs.

The "gentlemen's agreement" regarding export prices by the entente became unworkable early this year; as business depression continued two selling comptoirs were formed, as offshoots of the parent organization. The breakdown in the past four weeks of these two organizations which took months to set up is not encouraging to the future of such plans. Nevertheless, the desire to maintain close relationship between the leading steelworks of the principal European countries remains strong. It has been decided to hold together the framework of the entente, though it is well understood that the members are underselling one another. It may be possible under more favorable conditions to re-establish partial price control over a limited number of products, but complete control as conceived by the entente will be more difficult than ever.

European markets are far more complex than those in the United States. Price agreements are fragile things, with industrial and political interests so diverse and antagonistic. The experience in Europe, in contrast with that in the United States, may tend to strengthen the argument for a closer union of nations over there, as a fundamental of economic salvation, leading perhaps to a United States of Europe.

Why I Expect an International Trade Revival in a Few Months

By DR. DAVID FRIDAY
Economist and Business Analyst

OPTIMISM in the accompanying analysis of world business conditions is tempered by a thorough realization of problems which must be solved before prosperity again is an assured fact. Dr. Friday, an economist of note, expects 1930 to compare favorably with 1926 in profits. He sees promise in the steady purchase of bonds and believes it will lead to early improvement in international trade. He predicts that in 18 months production in the United States will be at the rate established in 1929. The present recovery starting in August, will lead to "something more than seasonal," in his opinion.

Dr. Friday recently returned from a visit of several months in Europe, where he studied economic conditions in the principal industrial countries. The address from which the accompanying article was abstracted was presented before the Bond Men's club of Chicago.—THE EDITORS.

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WHEN the final accounts are taken it will be found that profits for 1930 will compare very favorably with those of 1926, a year which at that time was considered exceptionally good and one with which comparisons will be made in the future. Dividend payments in 1930 will total higher than any year before with the possible exception of 1929, a factor aiding materially in the strong bond market which has obtained for some time. The most important factor in connection with the present strong bond market in high-grade bonds is the steady purchasing by the federal reserve system and the commercial banks throughout the United States. The weekly reports of member banks to the federal reserve system show that these institutions have been purchasing bonds for about six or eight months and, on the basis of experience in the past, this should continue for at least as long in the future at the rate of $100,000,000 monthly.

The strength in the domestic bond market will react favorably on the foreign bond market within a comparatively short time and this will enable financing by a number of foreign nations which have been awaiting the opportunity. The result should be a stimulus to foreign trade.

The restriction of credit in effect last year and the poor bond market are largely responsible for the extreme business depression of the past year. Over-production was a factor, and an important one, but one should not lose sight of the effect which credit restriction played. The delay in settling the Young plan also exerted a considerable influence.

Should Attain 1929 Production in Eighteen Months

But the United States as a whole is by no means as badly off as the pessimists would have us believe. Commodity prices are, I believe, pretty well liquidated in the majority of lines and wise executives are undoubtedly getting ready for forward commitments. By a year and a half from now we should be back on a level of production which will aggregate that of the early part of 1929.

A larger part of the foreign trouble is political and should be ironed out sooner or later, which will enable a return to normal trade with those countries. Despite lower prices for the principal commodities of many foreign countries, particularly in South America and the Orient, the return to normal conditions will be easier than in past years due to the large reserves of gold which many have accumulated.

As for the United States, I believe that the low point was reached during July and August and that the degree of improvement which has been manifested in the last few weeks will lead to something more than seasonal. It is noteworthy that the low point for average production during 1930, as reported by the federal reserve system was 95 per cent in July and August, while in no month during 1920, a period fondly compared by many with the present, did production get above 94 per cent.

THE BUSINESS TREND

Signs of Business Recovery Are More Positive

BUSINESS statistics released since the middle of September furnish encouraging evidence that the pulse of industry is quickening. Each successive favorable report adds strength to the belief that recovery is positive and is definitely gaining ground.

One of the most significant features of the present period is the evident caution exercised all along the line to refrain from doing anything that will make for fictitious prosperity. The majority of leaders are trying to make sure that all semblance of inflation has been squeezed out of the business situation before they launch a determined production drive.

This is demonstrated in the automobile industry, where builders are literally waiting for orders before turning out cars in quantity. Despite their care in this regard, output has been running ahead of car registration, but the margin is being reduced. The same condition holds in refined copper. Production and shipments fell off in August, permitting stocks to rise for the tenth consecutive month. Stocks of blister copper, however, were reduced.

Machine orders actually increased in August but the gain was not sufficient to establish an upturn in the three months' moving average index. It is reasonable to expect a rise in the index in September.

Railroad freight traffic in August was more encouraging, and when viewed in the light of railroad earnings in July, can be considered a bright spot in the business panorama. Net income of the Class I roads increased 20 per cent in July to the highest figure this year. The August volume of traffic should insure a good increase in earnings for August. Net income for seven months is 18 per cent below that for the corresponding period last year.

The record of building contracts continues as one of the disappointing phases of the business situation. August figures were lower, the loss in residential and industrial construction being marked. A number of authorities predict a pick-up in residential building before the end of the year, but so many expectations regarding building activity have been rudely shattered that forecasts are somewhat discounted.

However, the general outlook is moderately encouraging. Business is proceeding slowly toward higher ground.

The Barometer of Business

Industrial Indicators

	August, 1930	July, 1930	August, 1929
Pig iron output (Daily average, tons)	81,585	85,110	120,845
Machine Tool Index	110.2	117.3	286.1
Unfilled orders (tons)	3,580,204	4,022,055	3,658,211
Ingot output (Daily average, tons)	119,050	112,823	182,929
Dodge Bldg., awards in 37 states (sq. ft.)	39,932,500	44,604,200	66,720,000
Automobile output	240,100	275,298	512,842
Coal output, tons	35,661,000	34,634,000	44,475,000
Business failures; number	1,913	2,028	1,762
Business failures; liabilities	$49,180,000	$39,830,000	$33,750,000
Cement production, Bbls.	17,821,000	17,080,000	18,585,000
Cotton consumption, bales	352,335	378,385	558,113
Car loadings (weekly ave.)	934,073	888,933	1,120,141

Foreign Trade

	August, 1930	July, 1930	August, 1929
Exports	$300,000,000	$269,000,000	$380,564,000
Imports	217,000,000	219,000,000	369,358,000
Gold exports	39,332,000	42,529,000	880,000
Gold imports	19,714,000	21,888,000	19,270,000

Foreign Exchange

	Normal	August, 1930	July, 1930	August, 1929
Sterling	$4.867	$4.871	$4.866	$4.849
Francs	3.918c	3.934c	3.935c	3.914c
Lira	5.260c	5.239c	5.239c	5.230c
Marks	23.830c	23.893c	23.874c	23.819c

Financial Indicators

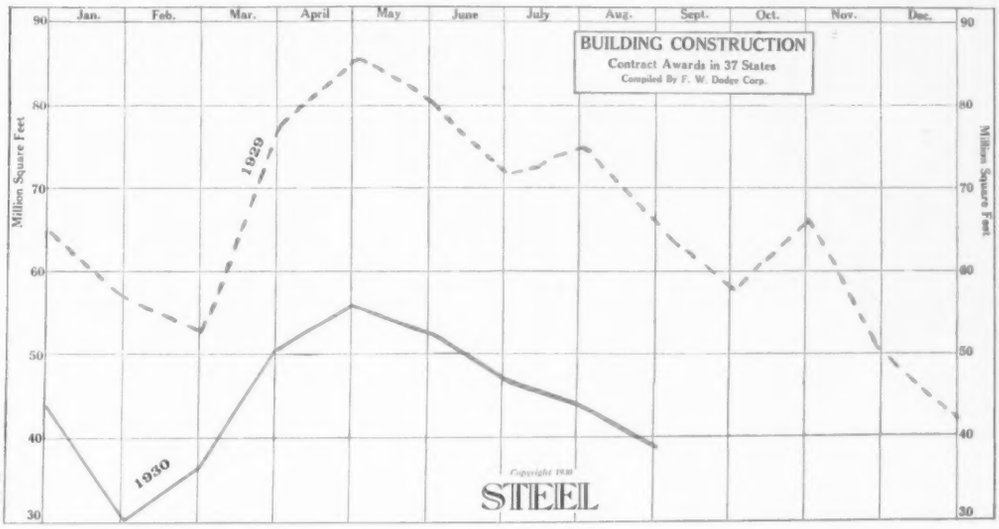
	August, 1930	July, 1930	August, 1929
25 Industrial stocks	$294.14	$286.57	$449.44
25 Rail stocks	112.34	112.52	156.96
40 Bonds	88.68	87.81	85.83
Bank clearings (000 omitted)	$38,390,582	$46,460,765	$58,441,030
Commercial paper rate N. Y., (per cent)	3	3-3½	6-6¼
Commercial loans *(000 omitted)	$8,472,000	$8,536,000	$9,329,000
Federal Reserve Ratio, per cent	83.1	80.7	74.6
Railroad earnings**	$82,750,153	$68,881,473	$122,782,807
Stock sales, N. Y. stock exchange	39,869,500	47,746,090	95,704,890
Bond sales, par value	$169,713,700	$190,802,300	$258,455,000

*Leading member banks Federal Reserve System.

**July, June and July, respectively.

Commodity Prices

	August 1930	July, 1930	August, 1929	Monthly average, 1913
Steel's composite average of 14 iron and steel prices	$32.99	$33.21	$36.54	$26.32
Bradstreet's index	10.43	10.45	12.67	.....
Wheat, cash (bushel)	1.03	.89	1.34	92c
Corn, cash (bushel)	1.16	.81	1.02	51c
Petroleum, crude (Bbl.)	1.18	1.18	1.30	$2.50



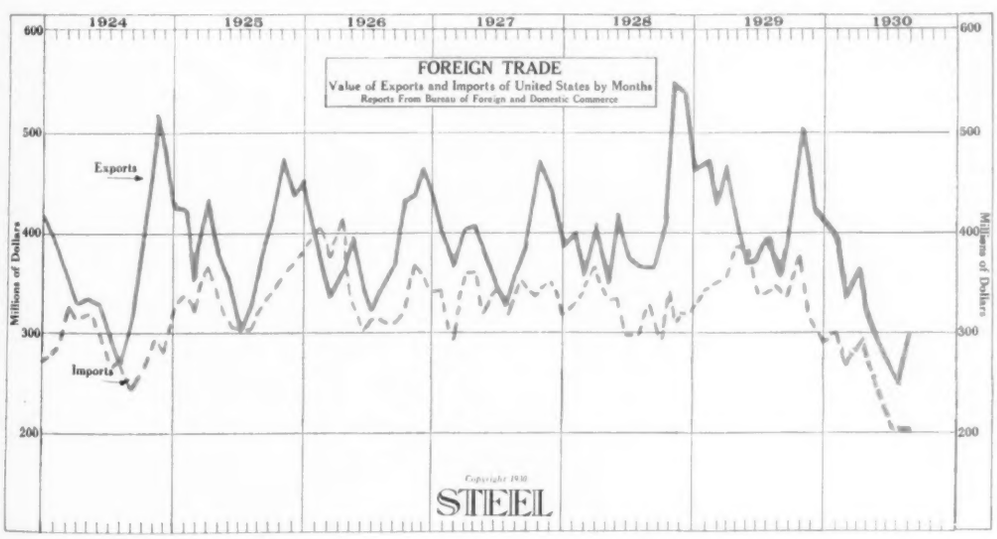
Square Feet	
August, 1930	39,932,500
July, 1930	44,604,200
August, 1929	66,720,000

Awards of Building Contracts Drop To Lowest Figure Since February

Building awards in 37 eastern states during the month of August were equivalent to 39,932,500 square feet, according to the compilation of the F. W. Dodge Corp. This is the lowest figure since February of this year when awards represented only 38,000,000 square feet. Residential contracts in August dropped to 16,843,000 square feet and bookings for industrial buildings aggregated only 3,699,000 square feet. Total awards in August amounted to only 62 per cent of the monthly average for 1929. In spite of the dullness in general building activity, construction in which structural steel is an important factor has continued in fair volume.

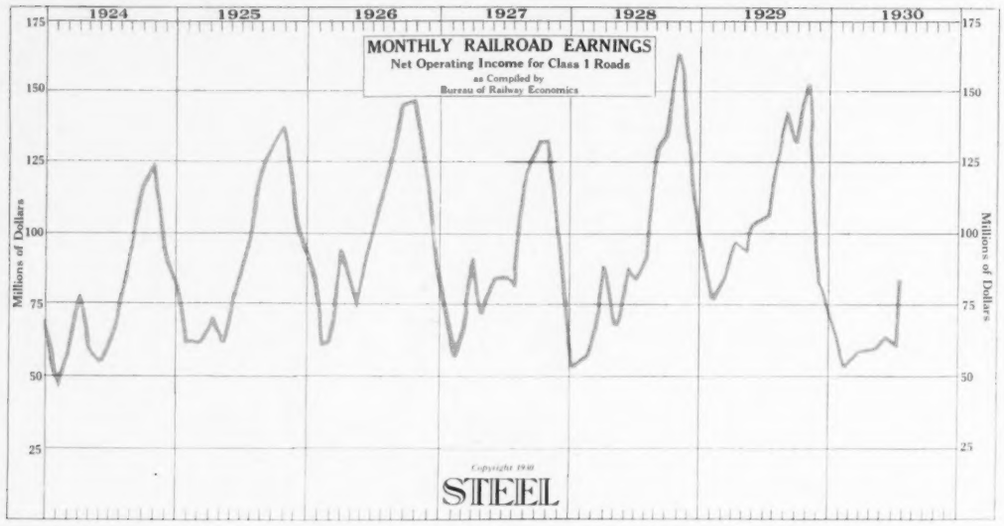
Exports of Merchandise Increase Sharply; Imports Lower

August foreign trade figures provide grounds for all kinds of conjecture. Exports of merchandise amounted to $300,000,000, a gain over the $266,628,000 in July but below the $380,564,000 in August last year. Imports were $217,000,000, a loss of two million dollars from July and a drop of $152,000,000 from August last year. The excess of exports over imports amounts to $83,000,000, a rather large figure compared with the balance of recent months. Exports and imports of gold in August were slightly below those of July, and the net outflow of gold for the month was slightly under twenty million dollars. In August of last year there was a net inflow of over eighteen million.



EXPORTS	
August, 1930	$300,000,000
July, 1930	269,000,000
August, 1929	403,359,000

IMPORTS	
August, 1930	$217,000,000
July, 1930	219,000,000
August, 1929	369,500,000



1930	
July	$82,750,153
June	68,881,473
May	69,173,825
1929	
July	$122,782,807
June	105,817,808
May	103,577,561

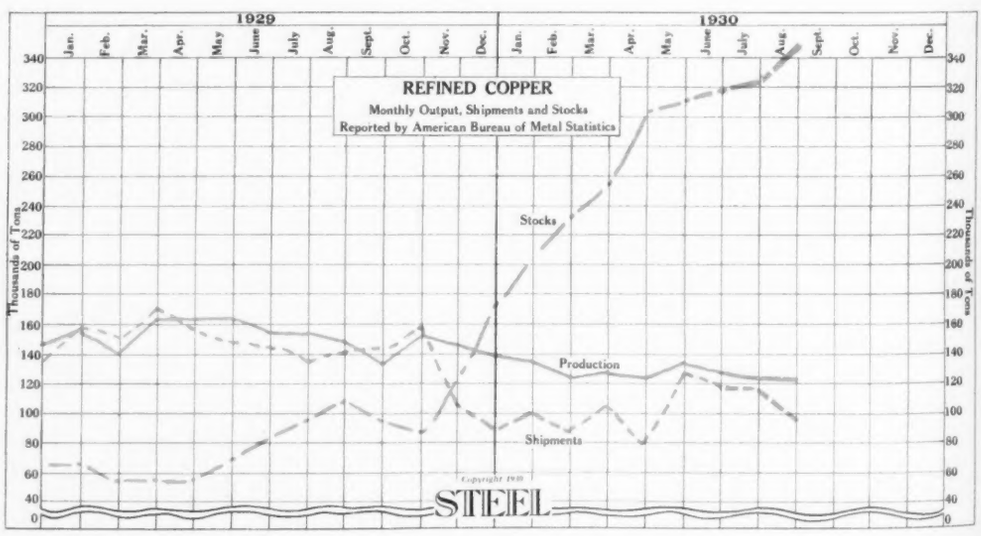
Net Income of Class I Roads Rises To Highest Point of Year

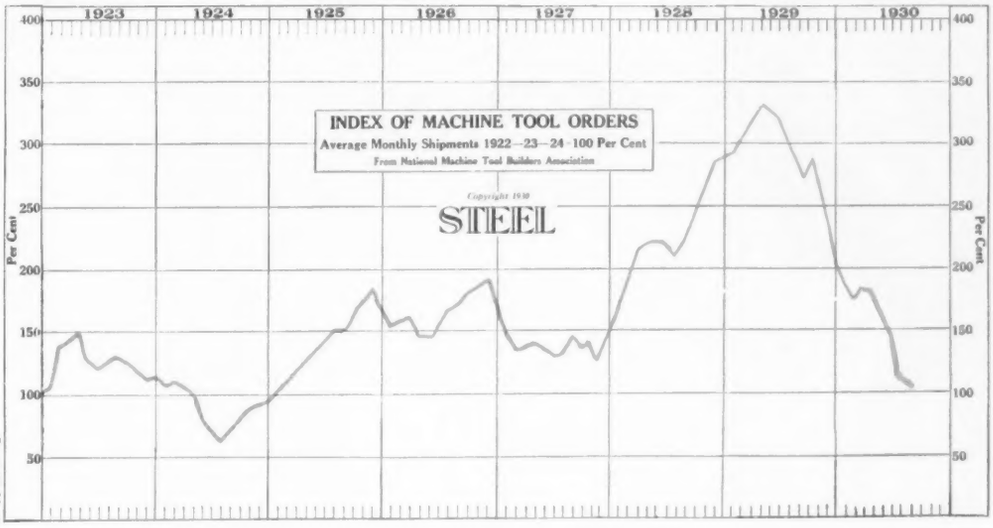
According to the report of the Bureau of Railway Economics, the net operating income of Class I railroads increased sharply in July to the highest point for any month since last November. The gain, approximately 20 per cent over the total for June, brought the net income for July to $82,750,153. However, this figure is 32 per cent below the corresponding total for July last year. Net income for the first seven months of 1930 was $458,943,343, which represents a drop of 18 per cent from the total for the first seven months of 1929. Increased traffic in August should bring a further gain in income in that month.

Production of Refined Copper Declines, But Stocks Continue to Grow

In spite of a reduction in the output of refined copper in August, figures of the American Bureau of Metal Statistics show that production still exceeds shipments and that stocks continue the steady uphill climb which started in April, 1929, and was only interrupted in September and October of last year. Production in August totaled 120,778 tons compared with 123,179 in July. Shipments were 95,129 tons in August, against 117,902 in July. Stocks rose to 347,688 tons as of Sept. 1, a gain of 25,649 tons over the last monthly report. A drop in blister stocks amounting to 8077 tons brought a measure of encouragement to copper producers.

Stocks	
August, 1930	347,688
July, 1930	322,639
August, 1929	104,372
Production	
August, 1930	120,778
July, 1930	123,179
August, 1929	148,648
Shipments	
August, 1930	95,129
July, 1930	117,902
August, 1929	142,005





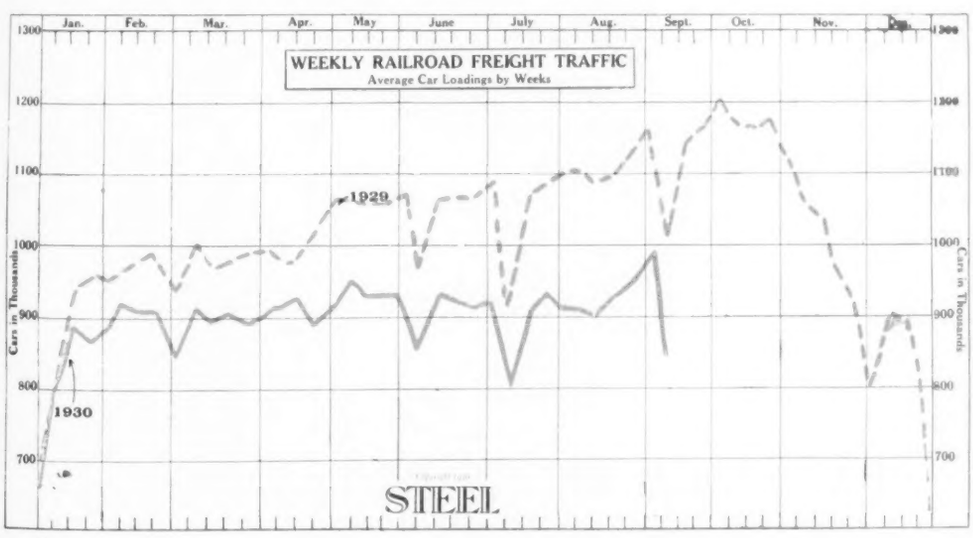
	1930	1929
August	110.2	286.1
July	117.3	294.8
June	146.7	315.2
May	165.1	329.5

Index of Machine Tool Orders Declines; Turn Forecast for September

The three months' moving average index of machine tool orders compiled by the National Machine Tool Builders' association stands at 110.2, as of Aug. 31 compared with 117.3 at the end of July. The index of gross orders (not the moving average) which was 91.1 in July, mounted to 113.8 in August, but the increase was not sufficient to establish an increase in the moving average. A comparatively small gain in new orders should turn the moving average index upwards in September. Cancellations in August were less than usual, while shipments were at low ebb. Machine tool builders have been receiving an encouraging volume of inquiries thus far in September.

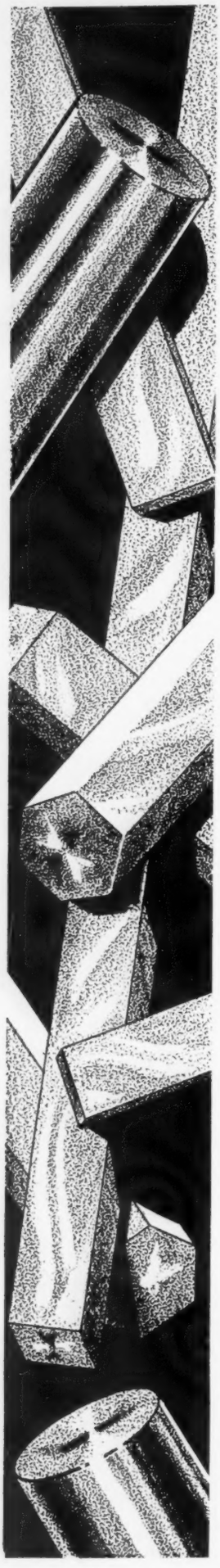
Volume of Freight Traffic 11 Per Cent Below That of Last Year

Cessation of activities over the Labor day holiday was responsible for a marked drop in loadings of revenue freight, thus interrupting an encouraging spurt which continued throughout August. Loadings during the week ending Sept. 6 amounted to 856,637 cars, according to the report of the American Railway association. This compares with 984,504 for the previous week and with 1,018,481 for the first week of September last year. Cars loaded to date in 1930 exceed 32,000,000 compared with a figure slightly above 36,000,000 for the corresponding figure for 1929. This means that the volume of revenue freight is only 11 per cent less than the heavy volume of last year.



1930	
Sept. 6	856,637
August 30	984,504
August 23	940,549
August 16	922,823
August 9	904,157
August 2	918,335

1929	
Sept. 6	1,018,481
August 30	1,162,100
August 23	1,137,966
August 16	1,102,567
August 9	1,092,153
August 2	1,105,920



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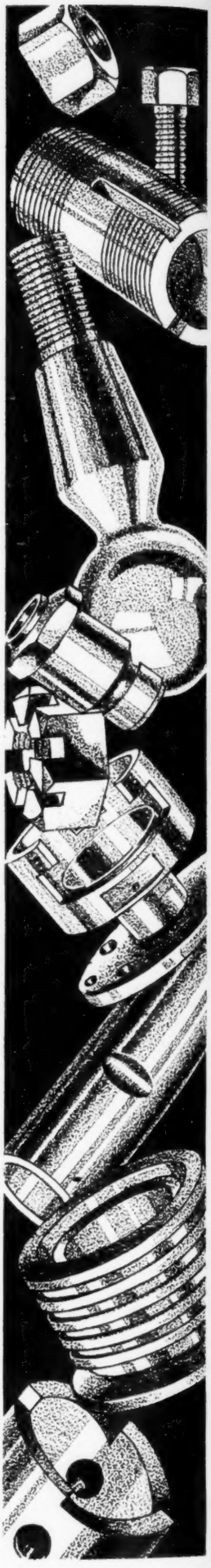
THE COLD FINISHED STEEL BAR INDUSTRY



Production

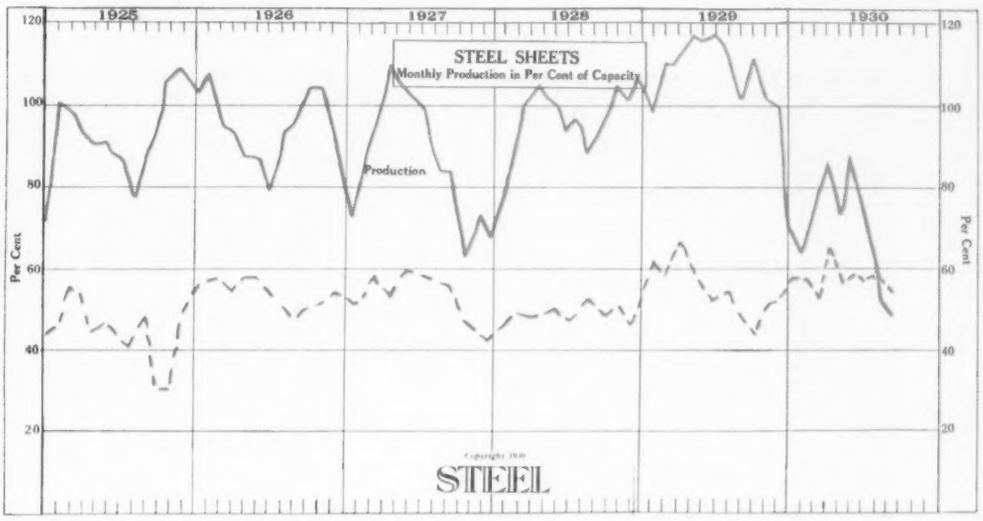
Per cent of capacity

	1930	1929
August	48.6	109.7
July	50.4	98.1
June	58.8	110.4
May	73.3	115.8
April	84.0	115.2
March	73.7	115.2
February	83.9	109.7

Stocks

Per cent of capacity

	1930	1929
August	50.9	42.9
July	54.9	46.9
June	57.3	53.5
May	54.7	49.4
April	56.6	53.8
March	54.6	59.7
February	61.4	63.3

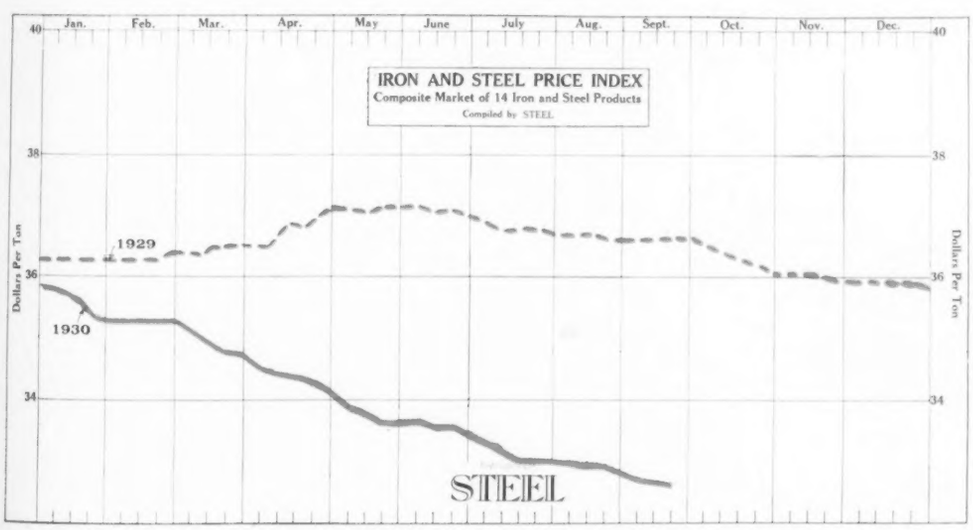


Output of Steel Sheets Drops; Shipments Increase; Stocks Are Reduced

Production of steel sheets by independent mills declined in August to 173,956 tons or 48.6 per cent of capacity. Sales dropped to 148,969 net tons, or 41.6 per cent of capacity, which is the lowest figure reported since November, 1929. However, shipments increased from 194,767 tons in July to 205,774 tons or 57.5 per cent of capacity. The drop in output and gain in shipments reduced stocks to 182,240 tons, as compared with 202,682 tons in July. Unfilled orders dropped to 373,148 tons as of Sept. 1, as against 432,298 tons on Aug. 1. The report reflects the cautious buying which now characterizes the sheet market under present unsettled conditions.

Index of Steel and Iron Prices Continues Downward Trend

In spite of a firmer tone in market reports, STEEL's composite of 14 steel and iron products on Sept. 17 stood at $32.64, a decline of four cents from the previous week. In the meantime several of the indices of wholesale commodity prices have registered gains for successive weeks. The lag of steel prices behind the general level of commodity prices is not unusual. In almost every depression the upturn in steel quotations not only trails behind the turn in other commodities but also is preceded by a definite expansion in demand for steel. Inquiries are now more encouraging, which fact coupled with signs of stability in quotations, may indicate an upturn in the near future.



Weekly Figures

Sept. 17	$32.64
Sept. 10	32.68
Sept. 3	32.78
August 27	32.88
August 20	33.00
August 13	33.00
August 6	33.08

Monthly Averages

August, 1930	$32.99
July, 1930	33.21
June, 1930	33.53
August, 1929	36.54

Photo by courtesy of Lincoln Electric Co.

WELDING

THE field of steel and iron offers abundant opportunity for the artist who seeks the spectacular. Many operations in the industry are good subjects for the expert working in oil or water color, or with photographic plates. The illustration above is reproduced from an especially effective photograph of the operation of electric welding

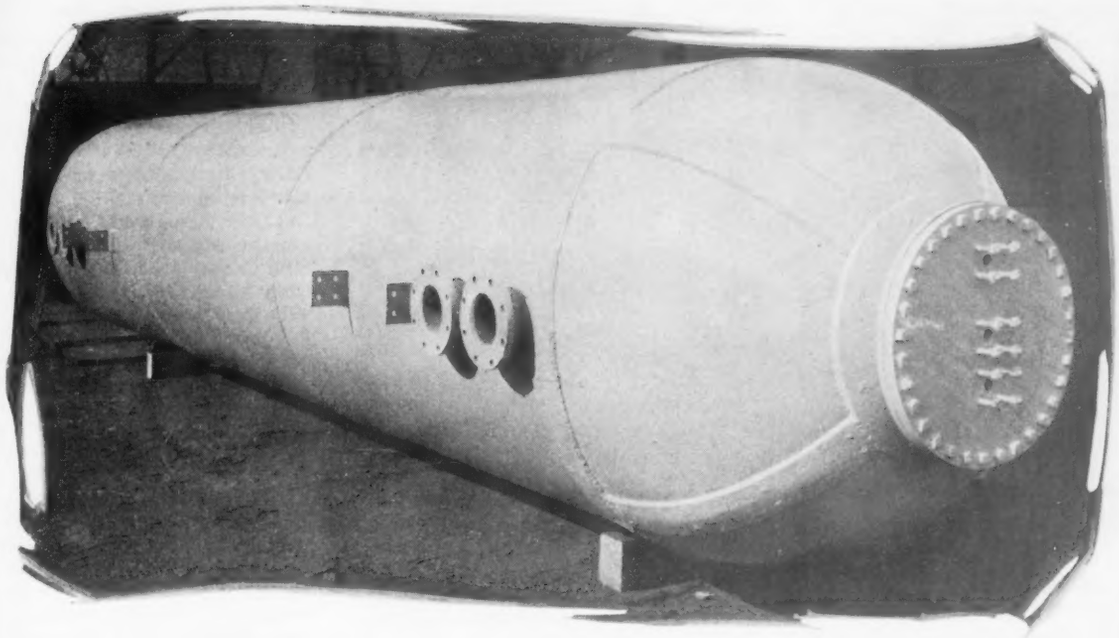


Fig. 1—Welded corrosion-resistant alloy steel tank for use in the chemical industry

Fabricates Chemical Tanks from Chromium-Nickel Alloys

BY H. R. SIMONDS
Associate Editor, STEEL

FULL advantage of the rapid development of corrosion-resistant alloys can be secured by industry only as such materials are fabricated into useful products. Some lag is inevitable between the development of a new alloy and the development of the most suitable fabricating processes for its use. However, in the case of chromium-nickel alloys, enterprising manufacturers are fabricating plates, sheets and other rolled products as successfully as they have carbon steel in the past. The Downingtown Iron Works, Downingtown, Pa., with a large plant and modern equipment, is specializing in fabricated products for the chemical industry which is of rapidly growing importance to alloy steel interests.

Engineers of the company estimate that at present nearly $10,000,000 worth of chromium-alloy steel is in service in the form of equipment in the chemical industry. The many different acids and gases encountered in the production of chemicals call for a variety of materials for the construction of containers, piping and equipment. Thus an alloy, which is suitable for nitric

Fig. 2—Containers and piping fabricated from alloy steel plates

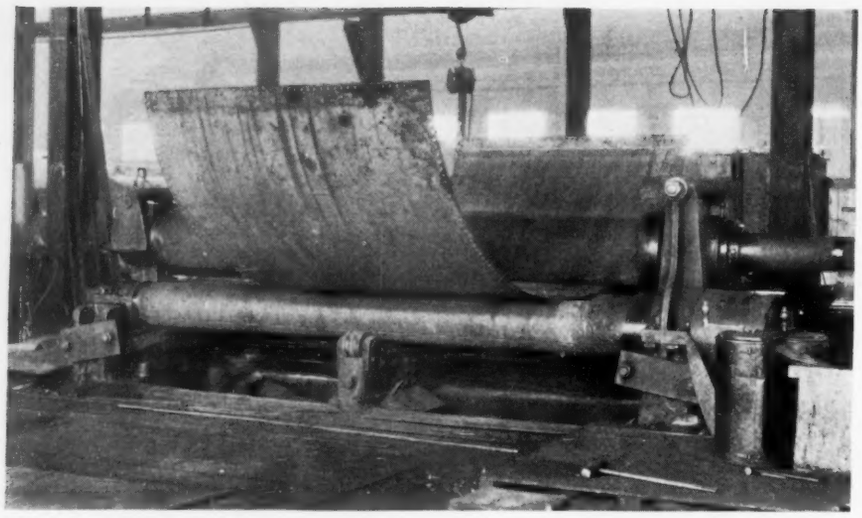


Fig. 3—Plate bending rolls for circumferential shaping of material

acid, is not the best to use for sulphuric acid. Tanks made of an alloy containing approximately 18 per cent chromium and 8 per cent nickel constitute an important part of the output of the Downingtown Iron Works and their fabrication requires unusual care and attention to detail.

The analysis of this alloy varies somewhat but a standard material used for a large number of tanks for the chemical industry has the following analysis, all percentages being approximate: Carbon 0.12, silicon 0.50 (governed by patent), chromium 18.00, nickel 8.00, phosphorus under 0.03, and sulphur under 0.03 per cent.

The physical properties of this alloy, as rolled, are approximately as follows: Tensile strength 85,000 to 110,000 pounds per square inch, yield point 50,000 to 70,000 pounds per square inch, elongation 25 to 30 per cent, brinell hardness 150 to 200, and reduction of area 45 to 55 per cent.

Quenching Increases Physical Values

This same material after quenching at about 2000 degrees Fahr. has the following approximate properties: Tensile strength 90,000 to 95,000 pounds per square inch, yield point 35,000 to 40,000 pounds per square inch, elongation (per cent in 2 inches) 50 to 60 per cent, brinell hardness 130 to 150, reduction of area 45 to 55 per cent. When the carbon-nickel-chromium ratio is correct this material is entirely austenitic. The company has found that chromium-nickel alloys of suitable composition are reasonably ductile and easily fabricated.

Other factors being equal the more homogeneous an alloy the better its resistance to corrosion. The tendency toward electrolytic action is reduced to a minimum in a homogeneous material which also is easier to machine and to fabricate. The company has found that both riveted and welded tanks of nickel-chromium alloy can be produced satisfactorily when there is assurance of a uniform austenitic structure.

The first consideration, therefore, in the fabrication of corrosion-resisting steel is the specification covering its structure. With a good material in hand the next step is the annealing after which the usual manufacturing processes follow. In riveting it is important that the rivets be heated in a muffled-type furnace under pyrometric control, and that they be held at the proper temperature for a sufficient length of time to assure satisfactory driving of the rivets. The rivets must be of the proper quality, and in order to guard against the accidental introduction of any stray carbon steel rivets, the company has adopted the policy of immersing all rivets in nitric acid which quickly demonstrates the presence of unsuitable material.

Riveting practice with 18 and 8 alloy steel follows closely that required for careful work with carbon steel. Rivets are driven at temperatures between 1850 and 2100 degrees Fahr. but are brought up quickly to this level from a soaking temperature below 1500 degrees Fahr. Rivet holes for 18 and 8 alloy fabrication are drilled to a diameter 3/32-inch smaller than the rivet diameter and then are reamed to 1/32-inch larger than the rivet diameter. This gives a circular clearance of 1/64-inch between the rivet and the hole.

Rivets Driven Hydraulically

Wherever possible rivets are driven with a hydraulic riveter. For long tanks the riveting machine shown in Fig. 4 is used. This is an upright machine set in a deep well making it possible to rivet long tanks and drums. A small tank in the process of riveting is shown. The equipment of the main fabricating shop is unusually complete and the production exceeds 1000 tons a month. A large plate bending roll is shown in Fig. 3. At the opposite end of the plant is the department where riveted and welded joints are tested hydraulically.

In welding nickel-chrome alloys it is highly important to have the welded area adequately resistant to corrosion. A good weld in chrome-nickel steel is dependent upon many factors, first of which perhaps is the human equation. Realizing this the Downingtown Iron Works has devoted special attention to the development of skilled and experienced welders. Both oxyacetylene and electric welding are used. The welding rod in both cases is composed of material similar to that of the base material. For oxyacetylene

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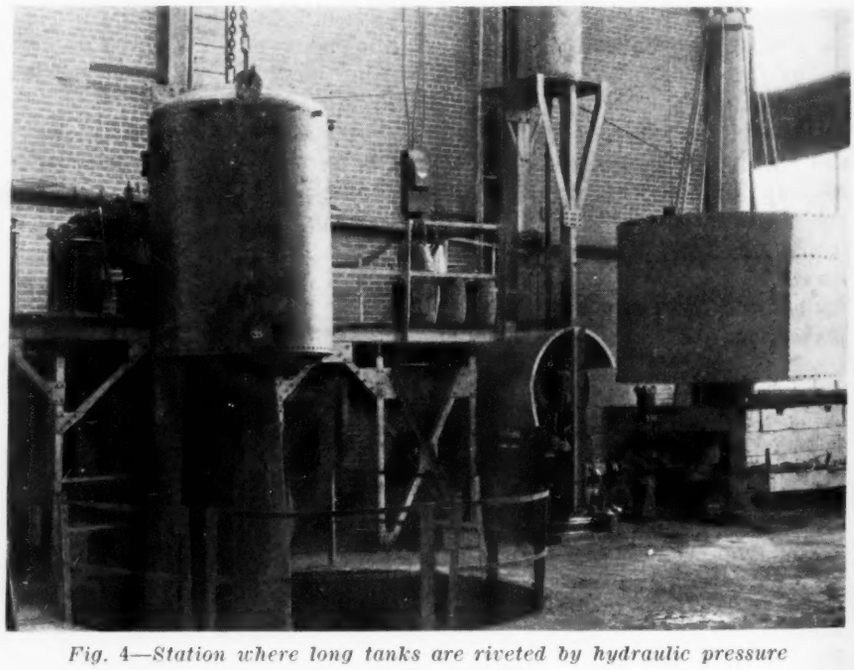


Fig. 4—Station where long tanks are riveted by hydraulic pressure

Budgeting Reduces Steel Plant Labor Turnover

BY L. C. EDGAR

Chief Engineer, Edgar Thomson Works, Carnegie Steel Co.

BUDGETING is a method of controlling waste of labor and materials so that economy may prevail and productive capacity increase.

A budget of labor and materials in a steelworks is an allotment of man hours or materials that is considered necessary to carry on the normal functions of the various departments, subdivided in such a way as to focus individual responsibility, and subject to change to meet varying percentages of operation. There are three main divisions to the work of establishing and operating of a steelworks budget.

1. *Determination of Proper Budget Allowances.* Since proper budget allowances are essential to the success of the budget system it is important that this work be handled by capable and intelligent men who have sufficient sympathy and human understanding not to antagonize those with whom they come in contact. The work preferably should be under the supervision of a responsible executive not in an operating capacity, but who has a thorough knowledge of the plant and its operations. The engineering department is a satisfactory department for this work, in which case the chief engineer and the general superintendent or general manager should be the only executives authorized to approve or change the budget allotments.

Favorable Attitude Necessary

The first step in setting a budget is to establish in the minds of the organization a favorable attitude towards the budget method of control. A good way to do this is by departmental meetings, calling together the department superintendent, assistants, foremen, and gang leaders and pointing out to them the advantages of a budget system.

You can not commend to men any scheme for driving them into economy of production; they must be led through self-interest. It is this alone that will keep men keyed up to the full capacity of their productiveness. Emphasis should be laid on the mutual interest of the men and the plant; for example, unless the plant is able to produce satisfactory product at low cost, other plants will get the business, and lack of employment will result. If it be necessary to lay off some men in order that low costs may prevail, it is better thus than that the entire plant be idle and the greatest number suffer unemployment.

Budget Promotes Fair Play

It should be pointed out to the men that a budget properly set is in the interests of a fair deal to them—that a foreman who is endeavoring and succeeding in making an improvement in his operations has the assurance of a measure of his achievements. Many foremen and superintendents go on year after year with no authentic record of the improvements they have made. The budget provides for this record of achievement.

This method of dealing man to man and the placing of definite responsibility upon the men will, in the great majority of instances, bring results. The objection to industrial relations is that in many cases a vague responsibility for uncertain things is placed upon men to the mutual dissatisfaction of both men and employers. Most men are proud of the work they do, if you give them a definite task with a fair index or measure of work done, you will get a favorable reaction.

The next step in the setting of a budget is the allotment of the proper number of man-hours considered necessary to carry on the normal functions of the departments, subdivided in such a way as to fix on each foreman in the department a definite responsibility for its operation.

A knowledge of past performance is essential and an investigation is made of the amount of labor used for the various operations as disclosed by past records. With this knowledge at hand, a field investigation of the work is made by the budget men, taking over the work with foremen and superintendents, and a complete verbal or written report of this is submitted to the chief engineer and the general superintendent for their suggestions. In the course of such investigations, many improvements, consolidations of duties, and economical practices are established. Thoroughness in this work is essential if a satisfactory budget settings are to be attained.

Established by Agreement

When the budget allowances are finally set up, the various foremen are called in and asked to agree to try to meet the budget set or say why they think the allowances can not be met. The budget allowance thus becomes a co-operative proposition, because it is established by counsel and agreement. At this time, it should be pointed out to the foreman or superintendent that he should do everything possible to equal or better the allotment of hours, and thereby reflect credit on himself and his department. This he may do by more careful supervision, new ways of doing things, changes in equipment to avoid the necessity of undue repair, etc.

2. *Operation of Budget Records.* Having established proper allotments, the second item is to compile and submit the proper records of the operation as shown relative to the budget.

This operation is a matter for the accountants, and the forms and methods of handling are worked out with them. The objective is that each day every foreman can be kept informed as to his standing relative to the budget, and that each week a summary of all the plant operations can be submitted to the general superintendent for his consideration and for further discussion at weekly meetings of department superintendents.

Utilizing existing time records and dovetailing budget records into these, enables this to be done with a comparatively small amount of extra

WELL designed plants and efficient machinery are of no use if, through careless management, labor and material are wasted. A carefully determined budget system will assist materially in removing unreliable standards used to control labor and material in steelworks practice. In the accompanying article, presented in a recent issue of Proceedings of the Engineers' Society of Western Pennsylvania, the author, L. C. Edgar, chief engineer, Edgar Thomson Works Carnegie Steel Co., Braddock, Pa., explains the budget system from the standpoint of allowance, operation and control.

clerical help. Each department is kept informed of its operating labor as it occurs, and no post-mortems of labor cost are necessary.

3. *Control of Budget.* The control of changes in budget settings remains with the chief engineer and the general superintendent, and a careful investigation always is made before any changes are accepted. The allowances are, of course, varied to meet fluctuations in operation.

This method of labor control can be beneficial only if administered with care and thoroughness. If so administered, it will foster cooperation and counsel and will make each man realize his duty to his employer and himself. It will give him a new sense of fair dealing and will increase his loyalty and stimulate his effort. Much can be achieved if proper guides and measures of achievements are provided; but, without such understanding, results from a budget system are difficult, if not impossible, of attainment. The first thing, therefore, is to get close enough to the men to obtain and hold their co-operation and assistance.

Starts New Ideas

A man who is earnestly striving to satisfy his employer will, at once, under a budget system, begin to think of ways and means of equaling or improving the budget set for him or his department. This he can do in several ways. He may plan his work more intelligently, and thereby accomplish more work with the expenditure of the same number of man-hours; or he may be able to suggest or point out some weakness in equipment that can be remedied; or he may make some constructive suggestion as to new and improved machinery or methods to reduce the man-power required.

This plan will promote better conditions throughout the plant because of better discipline and more orderly ways of doing things. It will bring about better maintenance conditions because of better and more intelligent supervision.

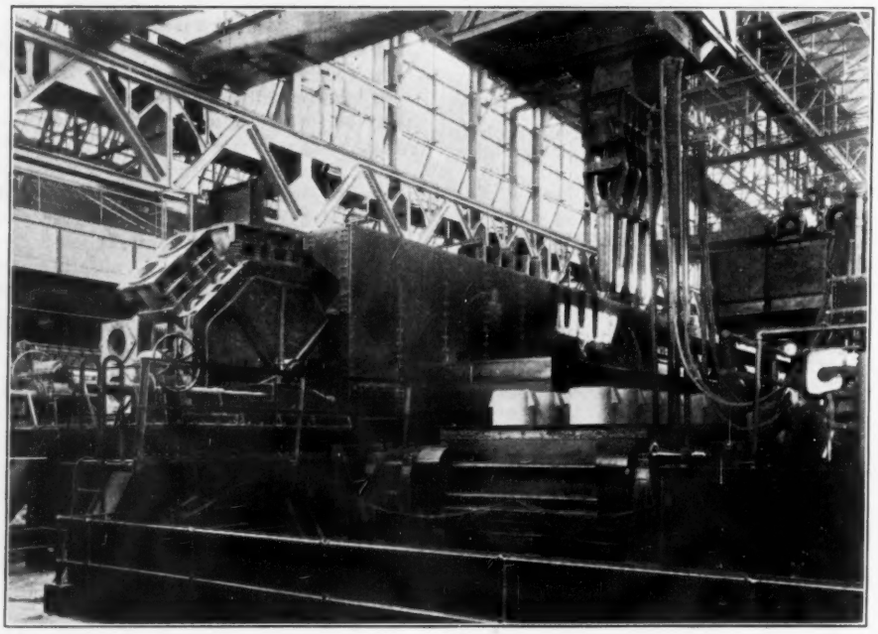
In connection with the operation of the budget, emphasis has also been placed on the fact that machinery and equipment must be adequately maintained, and that the plant must at all times be kept in good physical condition.

The budget has a tendency towards better conditions of repair and maintenance because when foremen and superintendents are operating under a budget system, they must of necessity pay more attention to the jobs at hand in order to meet the budget. Superintendents and foremen must, when operating under a budget system, investigate jobs more thoroughly before doing them, assign the correct number of men to the jobs, and prescribe the way in which the work should be done. Consequently, many jobs that ordinarily would be left to the judgment of the subforemen and gang leaders are, with a budget system, under more competent and careful supervision, with the result that they are done better as well as more cheaply. Futhermore, many improvements are suggested, due to this supervision, that would not be suggested without it.

Another outstanding advantage of the budget system is that it relieves the superintendent of a department of routine duties and permits him to devote more of his time to improving his department. A budget system will foster engineering progress because of a better knowledge of conditions by the chief engineer and all other executives of the plant.

The attitude of the chief executive of a plant to the budget, and the degree to which he assumes the responsibilty for the preparation and administration, largely determine the results to be obtained by the use of a budget system. A system of controlling labor and material if based on sound principles of efficient management and, if wisely and conscientiously administered, and worked out to meet the specific requirements, may be of substantial benefit to any plant.

Strips Ingot Molds in Series of Fours



STEEL production at the Rouge plant of the Ford Motor Co., Fordson, Mich., has been increased by the installation of a conveyor and transfer system in the soaking pit department. Four ingots are extracted from the molds at a time by a new Ford-developed tong crane and dropped vertically into a conveyor that moves along the edge of the platform. From this conveyor a single-tong crane lifts the ingots and transfers them into the pits.

A special feature of the system is the transfer table, whereby the cars are shunted back and forth into position for the extraction of the ingots and then put into position, ready for the return to the open hearth. The two cars shown in the accompanying illustration have been shunted onto the transfer table and the ingots removed. As each combination of two cars leaves the transfer table, they push ahead of them other empty cars waiting to be returned to the open-hearth department for another load.

Production in Italy Drops

Italian production of iron and steel showed a decided decrease during the first six months of the current year, according to a report to the department of commerce. Pig iron production which in 1929 totaled 342,112 metric tons was down to 263,389 tons. Steel production dropped from 1,100,149 tons to 893,978 tons.

Because import duties in Brazil are payable in gold, duties frequently are three and one-half times the apparent rate.

Manganese Steel Manufacture Involves Care in Melting

BY G. P. MESSENGER
Metallurgist, Kensington Steel Co., Chicago

NEXT to carbon, manganese is the most important element in iron, steel, and Hadfield manganese steel. The element's value is twofold; it confers characteristic physical properties on the metal and is active in dexodizing and degasifying it. The last property is the most valuable. Manganese oxide is a constituent of iron ores and, consequently, from 0.10 to 2.00 per cent or more, is introduced into the metal in smelting of the ores in the blast furnace. As manganese occurring in iron often is lost by oxidation in some later refining process, a convenient method of adding the element to the steel is in the form of ferromanganese, the standard grade of which is of approximately the following analysis:

Element	Per cent
Manganese	78 to 80
Iron	15 to 19
Carbon	6 to 8
Phosphorus, maximum	0.40
Sulphur, maximum	0.05
Silicon	1.00

Ferromanganese is furnished in lumps up to 75 pounds each and, when made under the best conditions, will not disintegrate or crumble. This ferroalloy is smelted from manganese ore with coke in the blast furnace.

Manganese steel falls among the true alloy steels, but the rapid increase in its manufacture during the past few years has made it a steel of much importance. The so-called Hadfield manganese steel is characterized metallographically by a structure of austenitic polyhedral grains. As cast, the steel almost always shows the presence of carbide particles, invariably found at the grain boundaries as shown in Fig. 1. By heating this steel to a suitable temperature the carbides in the austenitic matrix are dissolved. Quenching the steel from a high temperature retains carbides in the solution and as a consequence, a structure of polyhedral austenitic grains similar in appearance to the structure of pure metals is obtained. Fig. 2 shows the structure of annealed manganese steel.

Manganese steel properly made and treated offers a metal of unusual characteristics. Its main point of superiority over plain-carbon steels and most alloy steels is in its great toughness and resistance to wear. As a consequence, it is finding wide use where resistance to abrasion is needed. Some of its most prominent uses are for asphalt mixer, backfiller, ball mill, rod mill, tube mill, bank safe and vault, blast furnace, brick machine and caterpillar parts; concaves; crusher jaws; dippers for steam shovels; dragline buckets; hammers; pinions; pug mill parts; screen sand and gravel pump parts; roll crushing, teeth, trench machine; and track work parts for steam and electric railways. Manganese steel is practically nonmagnetic and for this reason finds wide use in the protecting plates used for electric magnets. While the larger portion of the tonnage made is used in the form of castings, it also finds wide use in forged or rolled products under which treatment it shows an increase in strength similar to carbon steels.

Fig. 1—Photomicrograph of high-manganese cast steel showing carbide particles at grain boundaries. X750

The chemical composition and physical properties of cast 12.00 per cent manganese steel when treated, are as follows:

Chemical Composition

Element	Per cent
Carbon	1.00 to 1.40
Silicon	0.30 to 1.00
Phosphorus	0.06 to 0.10
Manganese	11.00 to 14.00
Sulphur	0.01

Physical Properties

Tensile strength, lbs./sq. in.	95,000 to 110,000
Elastic limit, lbs./sq. in.	45,000 to 55,000
Elongation in 2 in., per cent	20 to 40
Reduction of area, per cent	20 to 50
Brinell hardness	180 to 200

While brinell hardness of manganese steel is from 180 to 200, this hardness, however, increases greatly with deformation. In use, therefore, the surface becomes intensely hard, while it is backed by tough ductile metal. The toughness appears to be due more to its high molecular cohesion causing the particles to flow rather than tear loose from each other.

To obtain metal of the usual high-manganese composition about five parts of molten low-carbon steel and one part of molten 80 per cent ferromanganese are mixed in a ladle. The ferromanganese is melted in a crucible or a special cupola. The crucible is preferable because of the low loss of manganese entailed in melting.

Affords Chemical Adjustment

Low-carbon steel can be made by any of the existing methods of steelmaking but most of it is produced by the basic open-hearth process. The largest percentage of castings made from this high-manganese metal is produced by the basic-electric process. This permits an even more careful and deliberate adjustment of the chemical composition of the finished product than is possible with other steelmaking methods. A further advantage is the minimum loss of manganese.

The bessemer process was one of the first methods used in preparing the necessary low-carbon molten metal. In the acid-bessemer process molten pig iron and steel are charged into an acid-lined converter. Air under pressure is blown through tuyeres in the bottom or sides and, passing rapidly through the metal, oxidizes the silicon, manganese and carbon in the order named. Since the converter has an acid lining and since the slag formed is strongly acid (due to 50 per cent or more silica) the two impurities in the iron, sulphur and phosphorus, are not even partially removed. In fact, because of the loss in weight of the charge due to the oxidation of silicon, manganese, carbon and some iron, the amount of phos-

phorus and sulphur increases 10 per cent.

The necessary low-carbon steel and 80 per cent ferromanganese are mixed in the ladle; the ferromanganese contains sufficient amount of carbon and manganese to bring those elements in the resulting steel to the desired proportion. The large amount of manganese addition to the low-carbon steel thoroughly deoxidizes and degasifies the metal. The removal of the dissolved ferrous oxide is accomplished principally by the manganese in the alloy. The reaction is as follows:

$$FeO + Mn = MnO + Fe$$

Sulphur will be in the comparatively harmless form of manganese sulphide. This reaction, which is of benefit to the steel, is as follows:

$$FeS + Mn = MnS + Fe$$

Phosphorus is assumed to cause brittleness in steel. In an amount exceeding 0.10 per cent it probably enlarges the grain, a factor promoting brittleness. Tests show that phosphorus above a normal amount (0.05 per cent) in manganese steel lowers its strength and decreases the toughness of the steel. This element, therefore, is kept below 0.05 per cent if possible. In the acid-converter process it can be controlled by the analysis of the scrap and pig iron used as a base for the steel. As an impurity, however, this element has an unsavory reputation gained over a period of many years, and steelmakers make every effort to keep the amount of the element low.

Basic Materials Used

In the basic open-hearth process a mixture of cold scrap and pig iron, either cold or molten, is melted down in a furnace having a lining of basic refractories and using a basic slag. All oxidizable elements, including carbon, silicon, phosphorus and manganese, are eliminated, either wholly or in part, in melting or refining. In addition sulphur may be partly removed as calcium sulphate. After these elements have been reduced to the point desired and the temperature of the metal and slag adjusted to that necessary, the heat is recarburized and tapped or tapped before being recarburized. Deoxidation and recarburization are accomplished sometimes in the furnace before tapping, but usually in the ladle while tapping.

One of the precautions necessary in basic open-hearth practice is to prevent rephosphorization. It is essential to keep recarburizers and deoxidizers from contact with the slag. Consequently, they usually are thrown into the ladle when the bottom is well covered with metal, early in the tapping, before any slag has left the furnace. Then the necessary low-carbon molten metal is poured from this ladle into a ladle containing the necessary molten 80 per cent ferromanganese, and making the composition of 12.00 per cent manganese steel. The large addition of manganese degasifies the metal.

In the acid open-hearth process a charge of steel scrap and pig iron is melted and refined in a furnace having an acid lining and using an acid slag. The acid process makes use of some refining reactions that are identical with the basic open-hearth process. There are some reactions present in the acid open-hearth process, however, that differ radically from those of the basic

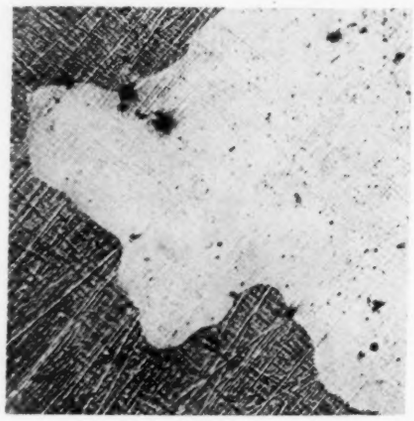


Fig. 2—Photomicrograph showing structure of annealed manganese steel. X500

practice. On the other hand there are refining reactions possible in the basic process that are impossible in acid practice.

How Silicon Is Removed

Silicon is oxidized to silica and slags away as a calcium-ferrous-magnesium silicate. Carbon is removed as carbon monoxide. It is impossible to remove sulphur and phosphorus to any extent by an acid lining and acid slag. The raw materials, scrap and pig iron, must contain a smaller percentage of these two elements than is desired in the finished steel. It is here that the acid progress is at a great disadvantage.

In contrast with the basic open-hearth process where oxidizing conditions are present up to the time of the tap, the slag in the acid process may be made much less sharply oxidizing. The metal thus may be deoxidized partly and the ferroalloys added in the furnace instead of in the ladle. The advantage of the acid open hearth is that more completely deoxidized steel can be made than is possible in basic practice.

Hadfield's manganese steel usually is made in an electric furnace having a basic lining. The cold scrap process consists of melting a mixture of manganese scrap, plate scrap and slagmaking materials, under conditions with little oxidation and finishing under a deoxidizing or white slag. The practice employed in melting this heat is commonly called "melting with complete reduction." Manganese steel scrap containing one or more easily oxidized elements should be melted by this method. The charge should contain as much of the alloy required by specification as is available from the scrap in hand.

A matter of importance in connection with the charge of a heat of this type is the thoroughness with which the scrap is kept separated. The manganese and carbon content of the scrap is of special importance. The heat must melt fairly close in carbon and manganese to the specification or a large quantity of silico-manganese alloy must be used with the alloying additions by dividing the percentage of manganese content in the steel by that of the carbon content.

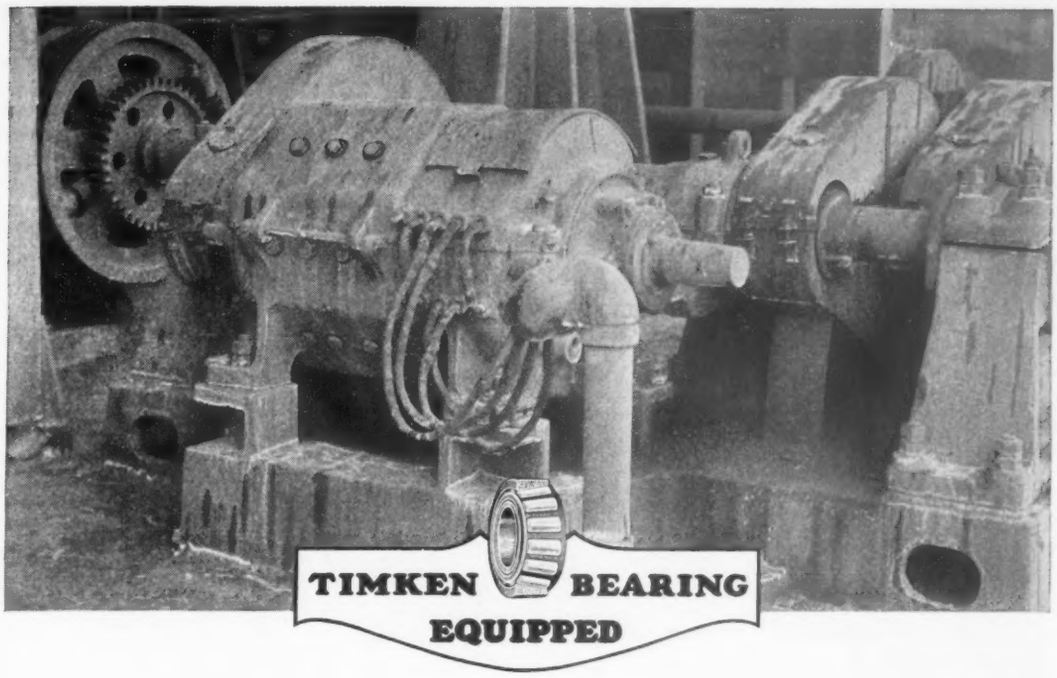
Low Phosphorus Is Essential

The phosphorus specified has probably the greatest restricting influence on the scrap available for the charge. It is obvious that no dephosphorization takes place in a heat which is run under reducing conditions from the beginning to the end. Thus, it is necessary to select scrap with a phosphorus content below that specified.

Lack of lime while melting down will result in a dark brown to a black slag, high in oxides, when melted. Care must be exercised in keeping the slag heavy in lime and yet in a fluid condition. This prohibits any addition of sand and if too thick fluorspar always must be used for thinning.

When the bath is melted, addition may be made to the slag to deoxidize it. The deoxidizing slag is composed of approximately six parts of lime, one or two parts of powdered coke and one part of fluorspar. The lime confers a high degree of basicity on the slag, the fluorspar confers fluidity and part of the coke added burns to carbon monoxide and thus fills the furnace with reducing gas. Another portion floats on the slag and reduces the metallic oxides which were contained in the slagmaking materials.

Two ways are possible for making this slag. One is to mix the slagmaking material well before adding it to the furnace and the other is to build the slag on the bath. The latter is preferable because less carbon is absorbed by the metal. After the correct slag condition is attained, it remains to keep it in proper shape throughout the heat. This requires skill and experience on the part of the melter. The influences of atmospheric oxygen or small portions of the bottom coming up may effect the condition of the slag. Keeping the slag in shape is done by adding lime, coke, or spar either separately or



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mixed as the occasion requires. By the combination of coke additions, maintaining the proper fluidity and excluding atmospheric oxygen as much as possible from the furnaces, the slag is kept in a good condition up to the time to take the test for analysis.

Color of Slag Varies

After the slag is fairly well deoxidized a test is sent to the laboratory for analysis of carbon and manganese. During the time the test is being analyzed the slag is made as near white as possible. The final slag, commonly called a white slag, varies in color from a pure white to a gray and light green. The slag disintegrates into a fine powder after being exposed to the air for a short time.

As soon as the results of the carbon and manganese analysis are received, such additions of ferromanganese are made to bring the steel up to specification, after which the bath is stirred and the slag dusted with coke. After allowing sufficient time for the alloy additions to melt and the slag to function, the bath is stirred and a test caught for temperature and fracture test. The fracture or bend test is used as a check on the computed manganese and carbon content as determined from the analysis.

If a difference in results is noted, another test bar is taken and if this fracture or bend test checks with the first, further addition of ferromanganese is made to the heat to bring the carbon and manganese content to specification. If the final test bar gives a bend test of 180 degrees before breaking, the fracture will assume a silky appearance being a silvery white and free from any trace of color. When this point is reached the metal is satisfactory and the heat may be tapped. The test bar, approximately 12 x ½ x ¾ inches, is poured on end in a sand mold. As soon as solid this bar is water quenched and bent until broken. The mold and breaking block are shown in Fig. 3.

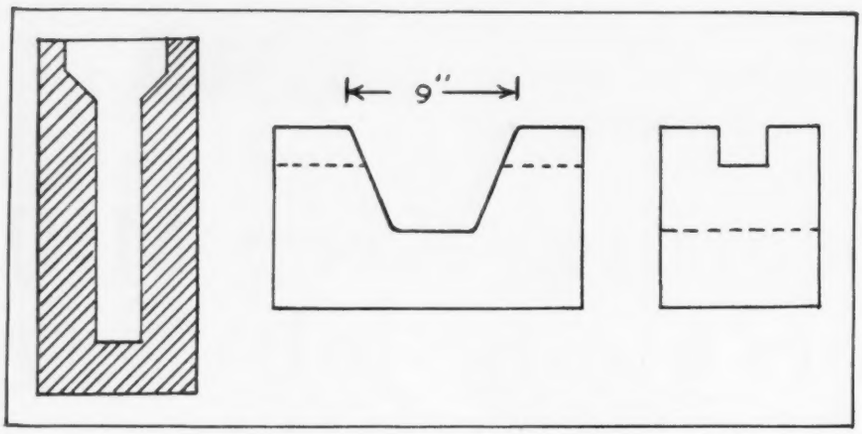


Fig. 3—Mold and breaking block for testing manganese steel

Many defects found in finished steel products originate in the melting furnace or ladle, before being poured into the molds. The final quality of the steel, however, is determined almost wholly by the melting and refining practice used. Most of the defects introduced in melting and refining are those classified as solid nonmetallic inclusions. These include particles of slag or dirt entrapped in the metal; manganese and iron silicates and sulphides are reaction products from manganese and silicon additions.

The amount of these inclusions depends largely on the process and the care used in melting and refining. Steel made by the acid-bessemer process will contain the largest amount of inclusions. Steel made by the basic-electric process has the least amount of inclusions. The product of the acid-bessemer process before deoxidation will contain the largest amount of dissolved ferrous oxides and the additions of deoxidizers will produce the largest amount of reaction products, such an manganese oxides and manganese and iron silicates. Although these products mostly tend to separate from the steel to join the slag, two factors work against this complete separation. These are lack of time and excess of dissolved oxides. In the acid-bessemer process only a few minutes elapse after recarburizing and deoxidizing before the steel is poured into molds. Again, the larger the excess of included reaction products formed the less the likelihood of a complete separation. Therefore, acid-bessemer steel mixed with molten ferromanganese will contain an appreciable amount of inclusions.

Reaction Products to Slag

The reaction products found as solid nonmetallic inclusions in steel are chiefly manganese and iron silicates, and manganese oxides. In the basic-electric process solid nonmetallic inclusions never are present in more than a trace. Where manganese steel scrap is part of the charge and melting is done under a reduced condition, no dissolved ferrous oxides are present in the metal after melting. The ferroalloys are added to the metal while it still is in the furnace and this gives the reaction products time to leave the steel and enter the slag.

There is always a possibility of the metal trapping nonmetallic inclusions from the slag. In well-made steel, patches of slag of appreciable size should not be present. They are used to the mechanical intermixing of slag and metal, usually on tapping; the violent churning as the slag and metal is poured into the ladle serves to break the slag if insufficient time is allowed for the inclusions to rise to the top. Slag inclusions from this source are prevented by tapping the metal before the slag and preventing, to a large extent, the mechanical intermixing of the two.

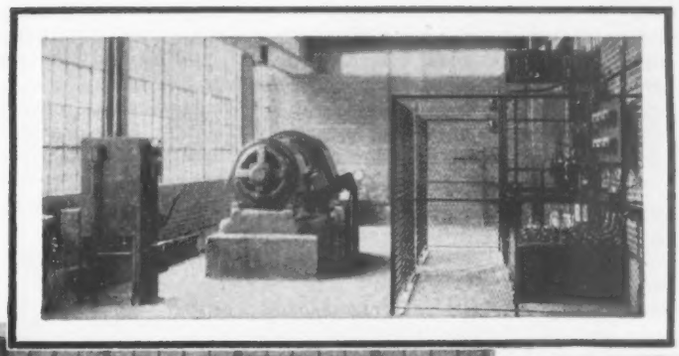
Refractories Must Be Watched

In the steelmaking processes particles of refractory material may spall off the ladle lining and contaminate the metal. In general when patches of the furnace lining or a weak batch of brick in the hearth commence to work loose they are apt to be of a fair size and will immediately rise to the top. This, of course, will effect a physical change in the slag condition. The contamination of the metal by particles of refractories may be wholly prevented by care in lining and repairing the furnace and ladles and in burning-in the furnace bottom. A nonmetallic inclusion introduced mechanically in the steel is shown in Fig. 4.

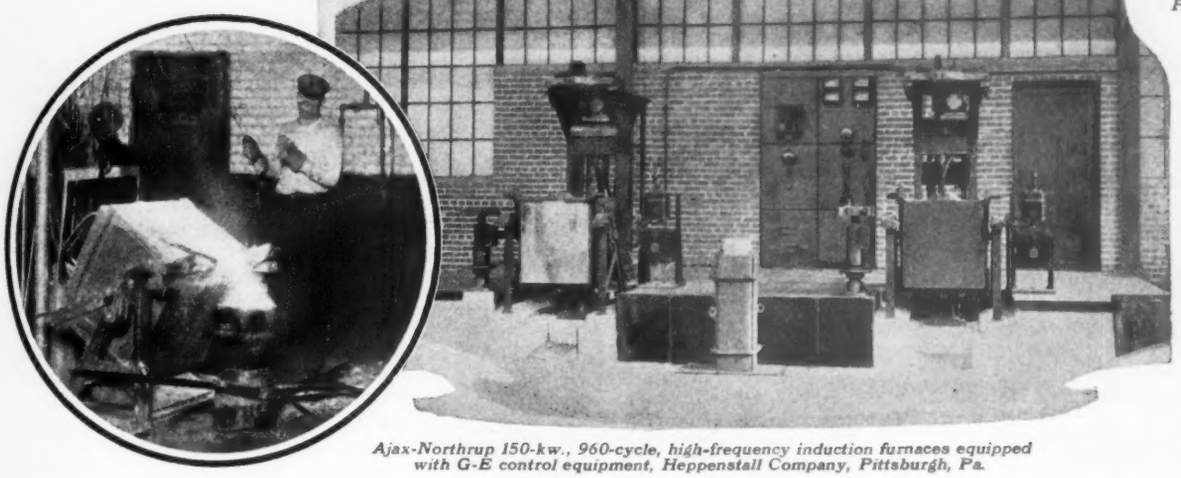
Manganese steel should be exceedingly hot before the heat is tapped. In tapping, the violent churning of the slag and steel usually causes small particles of slag to become entrapped in the steel. If sufficient time is allowed these particles of slag will have a chance to rise to the top, while the hot steel is being held for cooling to the normal temperature for pouring.

As a manganese steel casting comes from the sand, it is as brittle as the hardest white iron. In this condition it will crack or check on the least provocation and the greatest care must be exercised until the casting has gone through the heat-treating process.

The operation of shaking out consists of removing the solidified casting from the mold. The time of digging out varies with the thickness of the metal section and the shape and size of the casting. The shrinkage of manganese steel is high and a casting will crack unless cores or portions of the mold are removed as



G-E motor-generator set and control equipment, Heppenstall Company, Pittsburgh, Pa.



Ajax-Northrup 150-kw., 960-cycle, high-frequency induction furnaces equipped with G-E control equipment, Heppenstall Company, Pittsburgh, Pa.

Ajax-Northrup High-Frequency Induction Heating and Melting

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soon as the steel is solidified and strong enough to withstand handling. To facilitate removal, large cores often are made with sawdust or coke centers so they will be partially collapsible and will yield to the pressure of the shrinking metal.

If the casting is one with thick and thin sections, or sharp corners, shrinkage cracks will result even from cooling in still air, or cooling down in the mold to room temperature. These castings are removed as soon as the steel is solidified and strong enough to withstand handling, and risers and gates are cunt with an oxyacetylene torch. The castings are charged immediately into a hot furnace and allowed to remain until the heat has been distributed uniformly through the mass; they then are heated to the desired annealing temperature.

Small castings, gates and risers may be broken off with a sledge hammer. When these parts are of the heavy section they are cut with an oxyacetylene torch. Flame cutting of risers and gates is somewhat dangerous unless the castings are hot; it usually is done before heat treatment.

Welding Eliminates Defects

Usually a close surface inspection is given castings after they are dug out of the sand. In the case of noticeable defects the casting is scrapped before additional labor is involved. Shrinks or checks may be sufficient cause for a casting to be scrapped. Generally, however, these defects are eliminated by welding, which, if properly done, produces a section as strong as the original cast metal. It is necessary to use great care in welding to prevent the introduction of further strains due to uneven heating and cooling near the weld.

The usual practice in annealing manganese steel castings is to have the pieces of uniform size and shape. The rate of heating should be comparatively slow especially during the latter part of the heating operation. This is for the purpose of allowing such changes in the structure and, hence, in the physical properties to take place with a fair degree of completeness. Often the rate of heating is too rapid which results in cracking. The faster the steel is heated the greater the production and the lower the cost of fuel and the less the oxidation or scaling will be, but these three points must be balanced properly against the degree of quality desired.

The time of holding depends largely on the result desirable, but it must be kept in mind that too long a holding period will cause an undesirable degree of oxidation or scaling and insufficient stock for finishing, while too short a holding time will result in uneven heating or an incomplete change of structure or both.

In cooling, the castings are withdrawn from the furnace and dumped into water as cold as it is possible to obtain. This operation requires speed, because the difference of a few seconds may result in improper quenching, especially on thin section work. The quicker the castings enter the quench and coolant the better their quality. Other general precautions of importance which should be observed are (1) heating furnace must be of sufficient size and of proper design to heat the metal thoroughly and evenly, (2) the casting must be protected more or less completely from oxidizing effects of the heated

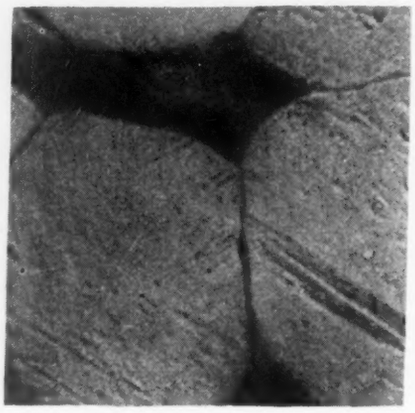

Fig. 4—Photomicrograph of steel showing nonmetallic inclusion introduced mechanically. X500

gases, and (3) a pyrometer must be employed for determining accurately the temperature at which these castings are annealed (1900 degrees Fahr.)

Manganese forms a solid solution with both gamma and alpha iron. In the presence of carbon, the carbide, Mn_3C, is formed, which practically contains the same percentage of carbon as Fe_3C and probably forms amorphous mixture with the latter. In "the cast condition" of manganese steel, the free manganiferrous carbide particles are found surrounding the austenitic grains and here and there patches of carbides are found in the austenitic matrix.

Carbide Into Solid Solution

When the steel has been heated through the critical range, the carbide present in the slowly-cooled steel is driven into a state known as solid solution. Gamma iron is the solvent and has received the name of austenite. The structure of austenite, when the steel has been heated to 1000 degrees Cent. or more and quenched in cold water, can be distinguished as a series of polygons of microscopic size, representing the cross sections of polyhedral crystalline grains. Then if the steel has been cooled slowly from its critical range this solid solution, austenite, again will break up into a mixture of crystalline grains of austenite surrounded by free carbides, troostite, and pearlite and invariably particles of carbides will be found in the austenite matrix.

Perfects Pickling Acid Unharmful to Steel

An acid, which removes scale and rust from the surface of steel and yet is unharmful to the steel itself, now is being marketed by the Allied Oil Co., Cleveland, under the tradename of Shell Pickling Acid. The discovery and perfecting of the material was effected by the research laboratory of a large steel manufacturer in the Middle West, in collaboration with the Shell Petroleum Corp., St. Louis, in an attempt to find an economical and nondestructive steel pickling solution and inhibitor.

The new acid is a pickling solution and inhibitor combined and is composed of 73 to 75 per cent sulphuric acid, a maximum of 1 per cent carbonaceous material, dissolved organic matter and water. Scale is cleaned from the surface of steel by the sulphuric acid, destructiveness to the virgin steel being prevented by the presence of carbonaceous and dissolved organic matter.

Fumes Are Prevented

While the temperature of the solution may be used up to 210 degrees Fahr., greater economy is obtained by holding the bath temperature between 160 and 180 degrees. A foam blankets the solution and prevents the escape of steam, thus conserving the heat of the bath and eliminating misty atmosphere within the pickling department. No sulphuric or nitrogen fumes are expelled from the solution thus minimizing acid consumption and preventing corrosion of the building, cranes, piping and other equipment. Moreover, the welfare of the pickling crew is enhanced, in that there is no irritation of the eyes, nose and throat and no discoloring of the teeth.

Steel, even with a high-carbon content, can be left immersed in the solution considerably longer than is required without danger of being overpickled. The average amount of acid required to pickle 1 ton of steel is low due to the nonattack on the metal other than scale and rust. At the plant of the Keystone Steel & Wire Co., Peoria, Ill., covering a period of three years, a saving ranging from 7 to 9 tons of acid a day was effected, with the consequent saving of 3 to 4 tons of virgin steel, by the use of this acid, based on a daily pickling schedule of 400 tons of wire in coils.

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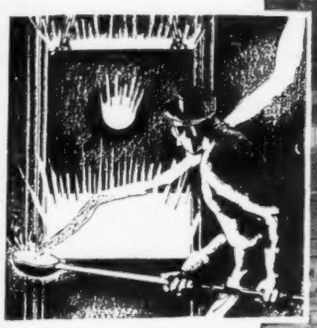

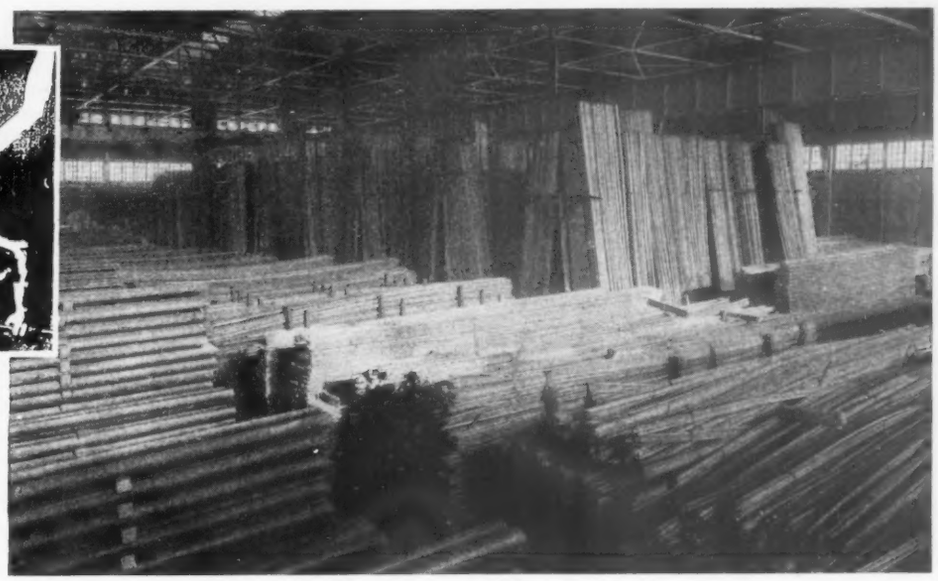

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The metal is poured from the furnace into a ladle in the pit

Chrome-Nickel Steel Castings Made in New Foundry

BY EDWIN BREMER

WITH the development of chrome-nickel steels possessing superior corrosion and heat-resisting properties, a new field has been opened up within a comparatively short period of time. These alloys can be produced in rolled, forged or cast form, thus a wide range of applications was found for the material almost over night. Numerous steel mills and foundries have undertaken the manufacture of the steel in its many analyses and from an insignificant and humble beginning the activity has expanded rapidly until it now constitutes an important portion of the business.

One manufacturer of the new alloy in castings is the Ohio Steel Foundry Co., Springfield, O., and the increase in demand for its product resulted in the company establishing a division separate from its regular line of steel castings and constructing a new foundry in which only alloy steel casting are made. The alloy castings include three different steels containing varying amounts of chromium and nickel. One of the alloys contains 35 per cent nickel and 15 per cent chromium and is used for heat resisting castings to withstand temperatures up to 2000 degrees Fahr. Such castings include furnace parts, skids, rails, chain conveyor chairs, annealing pots, lead and salt bath pots, oil still castings and enameling racks and retorts.

Another alloy contains 18 per cent chromium and 8 per cent nickel, which commonly is known as stainless steel. It is said to be corrosion resistant to a high degree and will resist temperature up to 1700 degrees Fahr. It is used for corrosion resisting castings, valves, oil still fittings, etc. The third alloy contains about 25 per cent chromium and 2 per cent nickel, and is used for castings that must withstand atmospheres containing large quantities of sulphurous vapors. Types of castings made from that alloy include rabble blades for sulphide ore roasters, drums for the manufacture of lithopone, etc. The alloy is said to withstand temperatures up to 2000 degrees Fahr., but is not strong at such temperature.

In designing the new foundry, steps were taken to include the most modern type of construction, to allow sufficient space for future expansion, and to provide good working conditions for the employes. All these conditions are met amply in the new building which is 100 feet wide and 200 feet long.

The building is divided into two bays. The main bay is 68 feet wide with a lean-to 32 feet wide forming the second bay. The main bay houses the molding department, and grinding and cleaning departments while the lean-to contains the electric furnace and transformer room, metallurgical laboratory, centrifugal casting machine, wash and locker room, mold drying oven, core drying ovens and the coreroom.

Capacity 100 Tons a Month

The foundry has a capacity of 100 tons a month. Metal is melted in a 1-ton electric arc furnace, shown in one of the accompanying illustrations, and supplied by William Swindell Bros., now the Swindell-Dressler Corp., Pittsburgh. The furnace melts 2500 pounds of steel every 2 hours with a power consumption of 900 kilowatt-hours per ton. Metal charges for the furnace usually are made up of alloy scrap with additions of chromium and nickel to bring the metal to the proper composition. The molten metal is poured from the furnace into either a 3000-pound teapot spout ladle or into a 3000-pound bottom-pour ladle which is placed in a pit approximately 7½ feet long, 7 feet wide and 5½ feet deep in front of the furnace. The bull ladles are preheated by a device consisting of a firebrick wall with an opening in the center through which a gas burner projects. The small hand ladles are preheated on a bench which contains burners projecting up.

At one side of the building opposite the electric furnace, a concrete-lined pit 9 feet 4 inches wide, 12 feet 4 inches long and 12 feet deep is located. This pit is used for making sand molds for centrifugally-cast alloy steel tubes and for castings requiring a floor pit. The machine for casting the tubes was designed by the company, and can produce tubes ranging from 4 inches to 16 inches in diameter and up to 9 feet in length. The machine is driven by a 50-horsepower slip-ring motor. The rotating member of the machine is a heavy cast tube which is belt driven. The flasks in which the sand is rammed are lengths of steel tubing with firebrick disks containing central circular openings forming the ends of the mold. The end farthest from the pouring spout has an opening about 3 inches in diameter while the spout end has a much larger opening. The flask is centered in the rotating member of the machine by adjustable steel blocks.

Castings are ground, chipped and cleaned at the lower end of the

foundry, that is to say, opposite the furnace end of the building. Gates and risers are removed from the castings either by oxyacetylene cutting or a special cutting off machine. The cutting off machine, which is motor driven, has a swing head and employs a rubber-bonded abrasive wheel ⅛-inch wide and 20 inches in diameter.

Portable Grinders Used

The castings are ground on a 20-inch, 2-speed swing grinder and a 24-inch stand grinder. Portable pneumatic grinders are used for light and finishing grinding. The castings receive a final finish in a room type sandblast machine.

In addition to the foundry an experimental metallurgical laboratory is maintained. It is equipped with a variety of equipment and includes a small heat treating furnace, a Rockwell hardness testing device, a brinell hardness tester, a hydraulically operated tensile and compression testing machine with a capacity of 50,000 pounds, and a device for determining the impact resistance of materials. The laboratory also contains polishing equipment and a metallurgical microscope for examining the structure of the cast alloys.

Photographic attachments are provided for the microscope so that permanent views of the various structures may be obtained for future reference, and darkroom facilities are maintained for the development of suitable prints. The metallurgical laboratory is supplemented by a chemical laboratory operated in connection with the carbon steel casting foundry which is housed in a separate building located nearby.

One of the unique features of the alloy steel foundry is that all the employes wear white uniforms. The company has found such procedure advantageous in that it inculcates the idea of cleanliness and accuracy. In keeping with the white uniforms, the interior of the building is painted in two colors. The lower brick wall is painted dark green as are the lower portions of the supporting columns. The upper portions of the columns are gray. The furnace, ovens, etc., are covered by aluminum paint. The interior of the metallurgical laboratory and the transformer room are painted white and kept clear.

New England Council Urges Better Merchandising

Five thousand business men in New England have just received the sixth and last bulletin of a series issued by the industrial committee of the New England council analyzing the present business situation and methods for dealing with it. The committee believes better merchandising on the part of producers is the key to net profits. Commenting on the committee's educational campaign, J. W. Hook, president, Geometric Tool Co., New Haven, Conn., says:

"One thing we have to learn from the present period of readjustment in business is that profits are in no small measure the sum total of savings effected at any possible point. Present conditions are a challenge to each business to increase the efficiency of its operations. Margins are extremely narrow, the buyer is king.

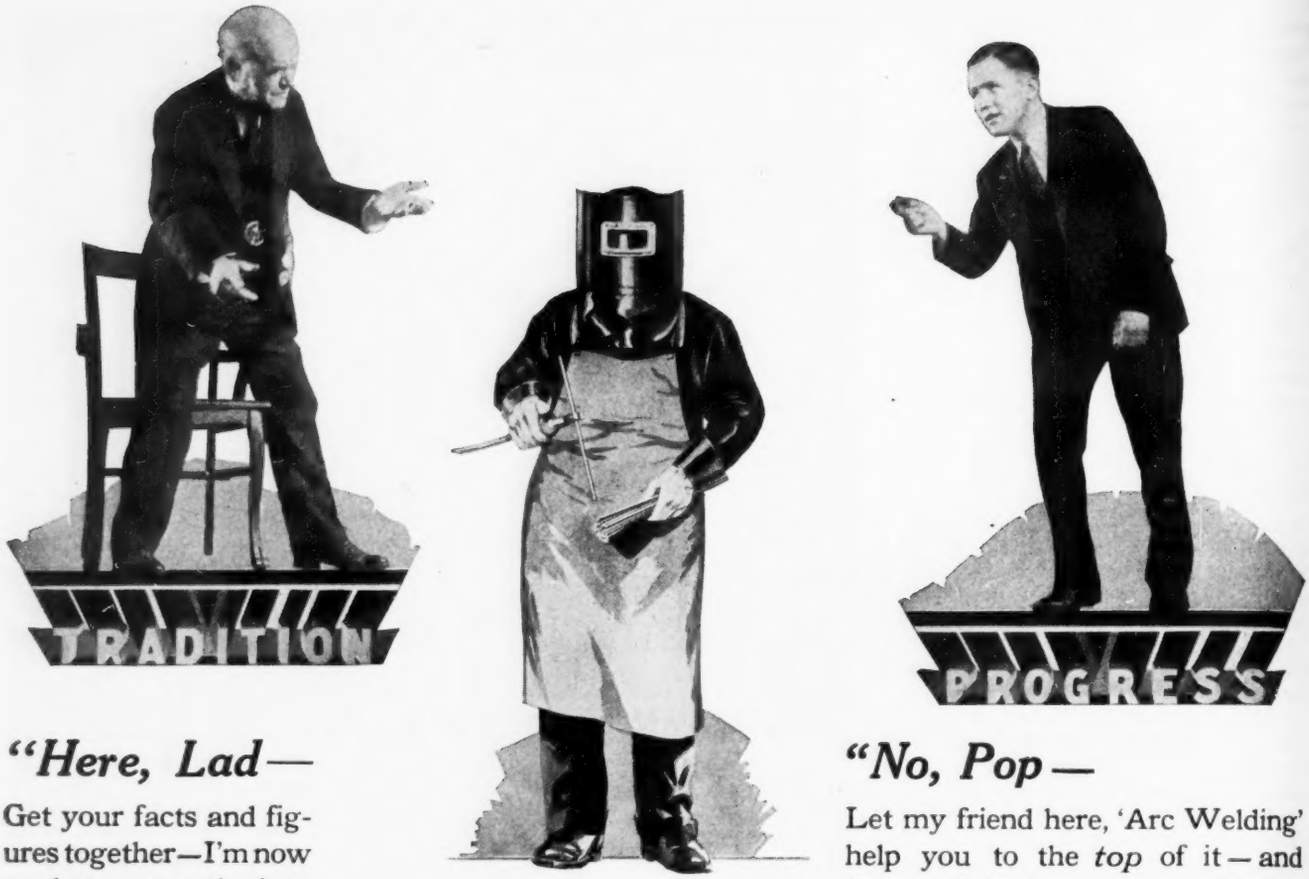
"Although in various lines volume is smaller this year than last, the firms that are working hard to stop at their source all unnecessary deductions from gross profits are the firms for whom the depression is already over."

Research Tests Resistance of Electrical Contacts

The amount of resistance, if any, between a nut and a bolt used for an electrical contact, a type of installation frequently employed, or between threaded holes and machined screws has been the subject of an investigation by the bureau of standards, Washington. While it is reasonable to assume that such contacts have a negligible resistance, little definite information has been available on the subject heretofore. The bureau made measurements of the contact resistance, using two radically different types of threads, four different materials and a wide range of mechanical stresses.

The types of threads used were the American National form of thread and the Dardelet. The materials used were copper bronze, brass and steel, and the mechanical stresses in the bolts extended from near zero well up toward the elastic limit of the materials. It was found that the contact resistance decreases to a marked extent as the stress is increased, and is only about one-fourth as large with the Dardelet thread as with the American National coarse thread. Further, in all or practically all cases, the resistance is so small as to be almost negligible.

Small molds are poured with hand shanks. The mold drying oven is shown in the right rear



"Here, Lad—

Get your facts and figures together—I'm now ready to get to the bottom of this arc welder business."

The Lincoln "Stable-Arc" Welder

— welds easier
— makes better welds
— permits greater output because of the steady uniform arc throughout entire welding range, which is the result of:

Variable voltage design
Laminated magnetic circuit
Separately-excited generator field
Double control of welding heat
All steel construction

No other welder has all these features.

"No, Pop—

Let my friend here, 'Arc Welding' help you to the *top* of it—and then we'll be in company with the Lincoln organization.

We need *their* help to get on top of the subject.

Due to their pioneer work in arc welding—due to their specialization in arc welding—due to their wider distribution of arc welders in industries—they are enabled to give us not only a better machine in the 'Stable-Arc', but equally important, this specialized experience of theirs is what we must take advantage of in order to get production economy.

If we don't get that economy we certainly will do as you say: Go to the bottom. So let's hop aboard that lifesaver which Lincoln, Noah-like, has provided—the 'Stable Arc'."

The Lincoln Electric Co., Dept. No., 20-9 Cleveland, O.

"Stable Arc" W-154

LINCOLN WELDER

Soil Pipe Coated, Wrapped Mechanically in Plant

WITH fabricating plants operating at capacity under heavy backlogs and with numerous long distance underground pipe lines contemplated and in process of construction, the question of protecting pipe from soil corrosion becomes both timely and of major importance. One of the most marked developments in pipe line practice of the past two years has been the introduction of mechanical means for the application of coating materials and fabric wrappings at the pipe mills by the Hill, Hubbell & Co. division of the General Paint Corp., Chicago.

The importance of proper application of protective substances can be understood best by keeping in mind that the objective of all known pipe protection materials is not curative, but is essentially preventive. Thus all existing types of protection are designed to accomplish one common end, namely to establish a seal about the surface of the metal and thereby exclude those agents which contribute to corrosion.

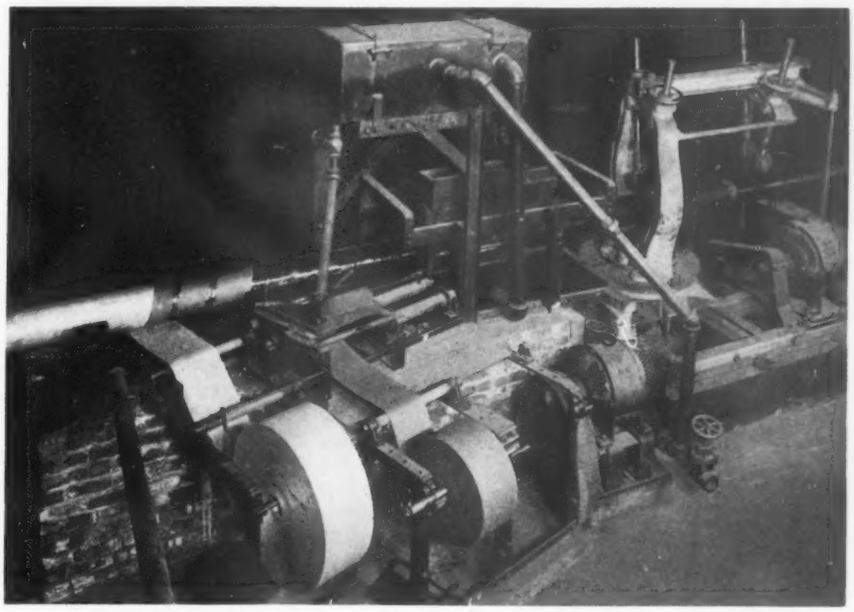
Commercial Value Seen

Mechanically applied coatings and wrappings, applied at the mills producing the pipe, are now claiming commercial acceptance since in something less than two years over 4000 miles of pipe has been protected by this method. Not only is the major advantage of proper application a strong influence in the selection of this method but it likewise removes the most troublesome shortcomings of the old hand application methods, among the most important of which are uncertain weather conditions occurring while the work is under way and the wide variation in temperatures which reflect directly on the physical characteristics of most coating materials. At the same time the burden of transporting the cumbersome equipment required for field application is greatly reduced because the material necessary for coating the extreme ends of the joints where the line is welded is insignificant when compared to the amount of materials required for the entire line.

A further advantage of considerable importance in mechanical application is the elimination of minute pinholes and bubbles which are so common to bituminous coatings when applied by the ordinary methods. The common practice of applying these materials by canvas sling does not thoroughly wipe the trapped air out of the material because the sling seldom comes in firm contact with the entire circumference of the pipe. By the mechanical method, the pipe completely rotates against a suspended sling, and in addition to the advantages thus obtained, an additional layer of bitumen is applied by flooding the contact side of the felt when it is applied over the first layer of coating. By this means a tiny bubble occurring in one layer is sealed by the subsequent layer.

The spiral application of felt, when controlled by mechanical means, permits an extreme degree of precision resulting in a uniform lap of about ½-inch and variation from this is mechanically impossible. Following the felt, a spiral wrapping of heavy kraft paper is applied with a lap slightly greater than the lap of the felt. This kraft paper serves a three-fold purpose, in that it prevents the occasional excretions of bitumen from between the laps in the felt from sticking to adjacent joints when loaded in cars for transportation; deflects sunrays in warm weather and thus avoids excessive softening of the bitumen; and enables observers to locate abrasion quickly because the sharp contrast between the light colored kraft paper and the dark surface beneath has a high visibility. Without such contrast abrasion in a continuous stretch of dark surface are exceedingly difficult to find.

Temperature control of the coating is another prominent advantage in this process. The physical properties of all bituminous coatings are changed greatly by wide variations in temperature, and it is rarely possible to maintain a uniform temperature in field application. By use of the machine coating process the temperature is held to a slight tolerance and is under constant observation throughout the operation. The same control is maintained against damp pipe surfaces and the usual variations in temperature prevailing in the open are not present when operating under shelter.



Mechanical arrangement for applying bituminous protective coating to pipe for underground lines. The machine also wraps the pipe with a layer of felt and a layer of heavy paper over the coating

A number of materials are available under the specifications offered to the pipe user for this form of application, and they embrace the leading coal tar base enamels and several ranking asphalts in combination with either asbestos or rag felts. Aluminum foil has been applied by this equipment with marked success.

The accompanying illustration shows the mechanical coating and wrapping machine in operation in one of the leading pipe plants. The pipe is fed into the machine and rotated as it is moved forward. It is scraped, coated and wrapped automatically, sections being loosely coupled together as the pipe is moved through the process. The flexibility of the mechanical equipment is best indicated by the fact that it accommodates pipe from ¾-

(*Concluded on Page* 60)

Fewer Foundries Producing Larger Castings Tonnage

NO ONE intimately identified with the foundry industry could fail to note important and basic trends during the past two years. These changes are reflected clearly and accurately in a study of the complete roll call of foundries of the United States and Canada, just published as *Penton's Foundry List* for 1930-31. Such production figures as are available showing the output of castings refute the assertion that the foundry industry is declining. On the contrary, important gains have been made in the total tonnage of certain classes of castings. The actual count of foundries making castings shows a smaller number in operation at present than two years ago, when a similar study was made.

This apparent paradox reflects the changes mentioned. Obviously better economy, a greater output per man and less wasteful manufacture is indicated, when fewer shops can maintain an equal or larger production. Economic conditions which have forced this improvement in practice have led to revamping, and a greater application of labor saving machinery. This change still is in progress and is even more far reaching under pressure of present business conditions. The total number of active founders in the United States and Canada on Aug. 15, 1930, was 5919, as against 6089 on the same date in 1928. Comparative figures follow:

	United States		Canada	
	1930	1928	1930	1928
Gray iron	3,573	3,834	397	408
Malleable	166	189	16	15
Steel	346	345	28	24
Electric	211	195	19	18
Nonferrous (exclusive)	1,407	1,420	72	75
Nonferrous (departments)	1,637	1,817	225	235
Aluminum	2,276	2,424	223	231
Total*	5,425	5,588	494	501

**This is net total, which makes allowance for overlapping and duplication. For instance, a foundry melting gray iron and aluminum appears as one unit in "total," but is listed under "gray iron" and also under "aluminum."

The past two years have marked a merger era greater than any previously encountered in American business. The foundry industry has participated actively in this movement, and many consolidations have led to centralized operation in more efficient units and the discontinuance of those shops which have been burdened by high cost due to part time or low rate operation.

No cause for disturbance is found in the fact that the total number of foundries in the United States and Canada is 170 less this year than two years ago. A great number of changes have been made. In fact 1750 variations from the 1928-1929 list were noted by the editors who compiled it. A total of 747 new foundries was reported and 248 changes in firm name indicate the shift in management, consolidation and revamping which has been in progress.

In the United States alone, 3573 gray iron foundries are in operation, as compared with 3834 in 1928. Important changes are evident in various states, verifying the fact that this branch of the foundry industry is the most sensitive indicator of basic industrial changes.

The increase of steel castings output over the past two years has brought only a slight change in the total number of steel shops, as will be noted from the sum of the steel shops of the United States and Canada, given as 369 in 1928 and 374 this year. Foundries making electric steel castings have made a marked gain. A new listing of die-casting foundries shows a total of 115 in the United States and 124 on both sides of the international boundry line.

The roll call of leading foundry cities shows two interesting changes. New York, with which Brooklyn and the boroughs are counted, moves up to third place following the leaders, Chicago and Cleveland. Los Angeles has advanced from seventh to fifth place, in line with the foundry development in California, previously noted. It is interesting to note the decline in the total number of foundries in various large centers. In many cases this reflects of merging and discontinuance of unprofitable shops. A total of 27 cities find place in the bracket embracing the 20 to 40 classification. Many cities which under a population classification would come far down the list, rank well in the total number of foundries. This is an indication of the decentralization of manufacture and consequent casting demand. The first 20 foundry centers of the United States and Canada are as follows:

Standing	City	Total Foundries 1930	1928
1.	Chicago	163	183
2.	Cleveland	113	121
3.	New York (Brooklyn and Boroughs)	112	92
4.	Detroit	94	100
5.	Los Angeles	91	74
6.	Milwaukee and West Allis	86	95
7.	Philadelphia	83	98
8.	St. Louis	60	65
9.	Boston (Greater Boston)	60	61
10.	Cincinnati	56	57
11.	Toronto, Ont.	49	45
12.	Buffalo	48	62
13.	Pittsburgh	48	61
14.	Newark, N. J.	40	41
15.	San Francisco	35	38
16.	Erie, Pa.	34	35
17.	Minneapolis	33	42
18.	Baltimore	33	37
19.	Montreal, Que.	33	36
20.	Dayton, O.	33	33

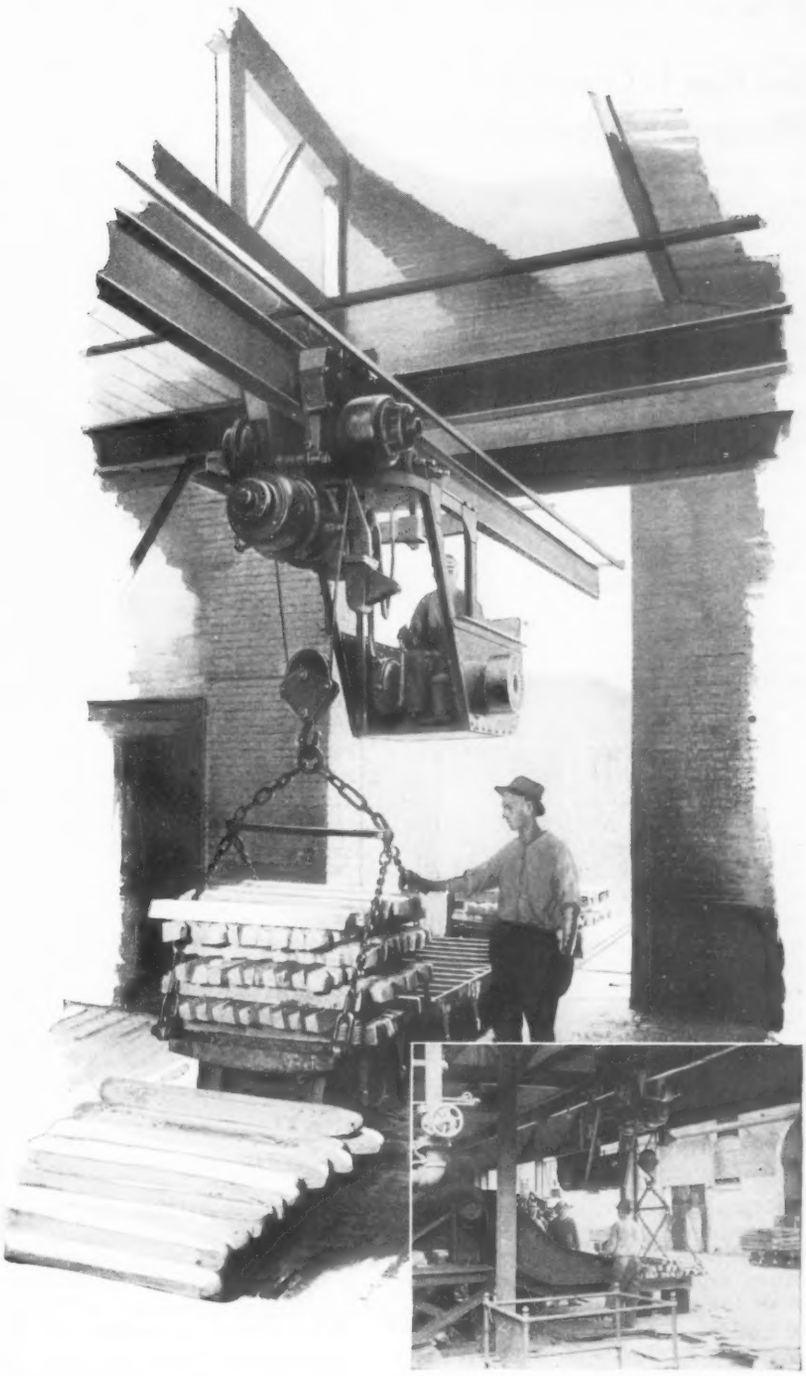
Among the states, no change is noted in the five leaders, which are in the order named, Pennsylvania, Ohio, New York, Illinois and Michigan. California is a newcomer in sixth place, taking precedence over

Roll Call of Foundries by States, 1930-1928

Standing	State	1930	1928
1.	Pennsylvania	684	728
2.	Ohio	595	603
3.	New York	479	494
4.	Illinois	425	441
5.	Michigan	355	367
6.	California	269	224
7.	Massachusetts	247	248
8.	Wisconsin	241	260
9.	Indiana	234	231
10.	New Jersey	217	220
11.	Connecticut	144	157
12.	Missouri	124	121
13.	Minnesota	101	112
14.	Alabama	98	96
15.	Iowa	94	104
16.	Texas	86	89
17.	Tennessee	78	83
18.	Washington	77	91
19.	Georgia	71	69
20.	Virginia	69	75
21.	North Carolina	64	67
22.	Maryland	53	56
23.	Oregon	48	58
24.	West Virginia	47	46
25.	Kentucky	44	48
26.	Kansas	44	42
27.	Rhode Island	43	45
28.	Colorado	42	47
29.	Oklahoma	34	43
30.	Louisiana	34	33
31.	New Hampshire	32	30
32.	Maine	30	31
33.	Nebraska	28	27
34.	Utah	24	22
35.	Vermont	22	23
36.	Florida	21	24
37.	Mississippi	20	21
38.	South Carolina	19	19
39.	Arkansas	16	17
40.	Delaware	15	15
41.	Arizona	10	11
42.	Montana	9	10
43.	Idaho	8	10
44.	District of Columbia	8	6
45.	South Dakota	6	6
46.	Nevada	5	5
47.	North Dakota	3	3
48.	Wyoming	3	3
49.	Hawaii	2	2
50.	New Mexico	1	3
51.	Canal Zone	1	1

Scheduled production

MAINTAINED WITH PLANNED LOAD-HANDLING



MOVING 300 tons of copper wire bar daily is the job assigned to each Shepard Electric Hoist at the Nichols Copper Company. There can be no hitch or halt in handling, that is why Shepards were chosen.

From furnace to inspection a 3 ton Cage Operated Shepard Hoist carries the bars. After inspection a 5 ton Shepard picks up a full load and moves it quickly to the dock, where the bars are weighed and checked before shipment. In spare time, furnace slag is disposed of by the Shepard hoists.

Years of this service exact no toll of Shepard Hoists. Within tightly sealed housings the balanced mechanism runs smoothly, in perfect alignment. Lubrication, in the proper amount is supplied continuously from an oil bath. Control is positive for all motions.

There are hoists in more than 500 standard types and capacities in the Shepard line—no need to accept a hoist that's "almost right". Insist on a Shepard. Have a Shepard Niles representative assist you in applying the hoist precisely suited to your needs.

SHEPARD NILES CRANE & HOIST CORP.
Main Office: 358 Schuyler Ave., Montour Falls, N.Y.
Works: Montour Falls, N.Y., and Philadelphia, Pa.

SHEPARD
CRANE & HOIST DIVISION

THE MOST COMPLETE LINE OF CRANES & HOISTS IN AMERICA

Wisconsin, which drops behind Massachusetts into eighth. Alabama and Iowa exchange places as fourteenth and fifteenth, respectively, and Texas moves up to sixteenth interchanging with Washington. Thirteen states have a total of more than 100 foundries within their borders, and gains are shown by California, Indiana and Missouri in this upper range of important commonwealths as measured by the number of foundries.

Soil Pipe Is Coated and Wrapped Mechanically

(*Concluded from Page* 57)

inch sizes to 26 inch sizes with equal precision. The first plant installed for this work began operations in August, 1928, and since that time a total of six plants have been installed to accommodate the pipe produced by most of the leading pipe manufacturers of the country.

The usual practice in mill work is to leave a few inches bare at the ends of the joint so that welding or coupling can be accomplished without interference. These joints are then coated and wrapped by hand just before the line is dropped into the ditch.

Experiments are being conducted to develop a practical traveling type machine for the application of coatings and fabrics on the line at the right of way, and some progress has been made in this direction, although at this moment there is no equipment offered for commercial work without some reservation as to its performance. Such a machine will serve a most useful purpose in the reconditioning of lines now in the ground but the inability to avoid adverse weather conditions and the natural limitation to the control of temperatures and dampness probably will favor mill application where conditions will permit its use.

Fabricates Chemical Tanks from Chromium Alloys

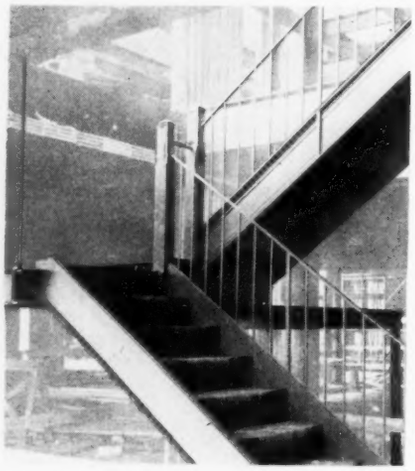
(*Concluded from Page* 44)

welding a bare rod is used and for arc welding a coated rod. Chrome-nickel steel can be welded with a much greater degree of satisfaction than the straight chrome steel, metallurgist's objections being removed, such as, for instance, grain growth in the welded area. However, in any extensive welding job, the greatest care should be used to avoid blowholes, the formation of oxides, or slag inclusions in the weld itself.

Pioneer Heat Regulator Corp., formerly of Bloomfield, N. J., has taken manufacturing space at New Bremen, O., and employs ten men in the manufacture of thermostatic controls.

New Channel Section Makes Convenient Stair Stringer

STRONG and light stair stringers intended principally for buildings such as schools, churches and public buildings where foot traffic is heavy and wide tread is required is provided by a 12-inch light-weight steel channel section now being rolled by the Jones & Laughlin Steel Corp., Pittsburgh. The new section



Typical office building stair installation employing light-weight channels. Stair in upper portion of picture shows appearance of channel finished with molding

supplements a 10-inch section introduced by the company two years ago. The channels are available in three weights: 10-inch section in 8 pounds per foot and 8.8 pounds per foot; and 12-inch section in 10.6 pounds per foot. They are rolled sections having straight true lines and sharp corners.

Used in rear stairways without ornamentation, these channels provide a finished installation of neat appearance, although they are adaptable to any type of decorative treatment and may be made attractive in exposed stairways where beauty is equally as important as utility. Material savings in weight and in time required for fabrication and installation compared with standard channels are claimed for the light weight channels.

Ferro Machine & Foundry Co., Cleveland, recently completed an addition.

Convention Calendar

Sept. 25-27—American Electrochemical society. Fall meeting at Hotel Statler, Detroit. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Sept. 29-Oct. 1—American Gear Manufacturers association. Semiannual meeting at Hotel Clifton, Niagara Falls, Canada. T. W. Owen, 3608 Euclid avenue, Cleveland, is secretary.

Sept. 29-Oct. 4—National Safety council. Nineteenth annual safety conference at William Penn hotel, Pittsburgh. William H. Cameron, Civic Opera building, Chicago, is managing director.

Oct. 8—Gray Iron institute. Third annual meeting at Hotel Cleveland, Cleveland. Arthur J. Tuscany, Terminal Tower building, Cleveland, is manager.

Oct. 13-17—American Gas association. Annual convention and exhibit at Auditorium, Atlantic City, N. J. Kurwin R. Boyes, 420 Lexington avenue, New York, is secretary.

Oct. 20-22—Concrete Reinforcing Steel institute. Semiannual meeting at Briarcliff lodge, Westchester county, N. Y. M. A. Beeson, 2112 Tribune Tower, Chicago, is secretary.

Oct. 20-23—National Hardware Association of the United States. Annual convention at Marlborough-Blenheim hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 20-23—American Hardware Manufacturers association. Annual meeting at Marlborough-Blenheim hotel, Atlantic City, N. J. Charles F. Rockwell, 342 Madison avenue, New York, is secretary.

Oct. 20-23—Association of Sheet Metal Distributors. Annual meeting at Marlborough-Blenheim hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 24—American Refractories institute. Fall meeting at Traymore hotel, Atlantic City, N. J. Dorothy A. Texter, 2218 Oliver building, Pittsburgh, is secretary.

Oct. 24—American Iron and Steel institute. Semiannual meeting at Hotel Commodore, New York. E. A. S. Clarke, 75 West street, New York, is secretary.

Oct. 24—Rail Steel Bar association. Semiannual meeting at Hotel Commodore, New York. H. P. Bigler, 228 North LaSalle street, Chicago, is secretary.

Oct. 27—American Institute of Steel Construction. Annual meeting at Pinehurst, N. C. Charles F. Abbott, 285 Madison avenue, New York, is secretary.

The New Jersey chapter of the American Society for Steel Treating recently elected the following officers for the year 1930-31: Chairman, H. D. McKinney, vice president, Driver-Harris Co., Harrison, N. J.; vice chairman, John F. Wyzalek, manager, service division, Hyatt Bearings division, General Motors Corp., Harrison, N. J.; secretary, John H. Johnson, salesman, Firth-Sterling Steel Co., New York; and treasurer, R. W. Thorne, salesman, Colonial Steel Co., New York.

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

USES:

Cobalt Magnet Steels

Development, properties and treatment of magnet steels discussed by H. E. Kershaw, in the Edgar Allen News (England), September 1930, *p.* 701, 4¼ *pp.*, 4 *illusts.*

Manufacture of cobalt magnet steel is divided into two classes, namely, the low and medium cobalt-chrome steels and the high-cobalt steels. The former grades are air-hardening but considerable improvement can be brought about by giving the steel a triple heat treatment. This consists of heating the magnets fairly quickly up to 1150 to 1200 degrees Cent., holding at this temperature for two or three minutes and then cooling in air. The second part of the treatment is to reheat to about 720 degrees Cent. A marked recalescence occurs at about 680 degrees and the temperature of the magnets rises spontaneously. After this has died away, cool the magnets in air and reheat to about 1000 degrees Cent. for final hardening. The heating should be done quickly.

High-cobalt steels are of the oil-hardening types. A single treatment only is necessary but accurate temperature control is essential as any elevation above the necessary hardening temperature, which is about 950 degrees Cent., brings about the retention of austenite on quenching and a low remanence is obtained. The rate of cooling is important. Thin oil should be used and should be kept cool.

STEEL 9-25-30

Corrosion of Steel

Oxidation of steel by atmospheric influences discussed by J. S. Unger, in United States Steel Quarterly, Autumn number 1930, *p.* 45, 3½ *pp.*, 1 *illust.*, 2 *tables.*

Steel alloyed with about 0.25 per per cent copper has increased life when exposed to atmospheric corrosion. The performance of copper steel and plain steel in steel freight cars is compared. Paint adheres much better to copper steel in a car body than it does to plain open-hearth steel. Where mechanical abrasion has not been a serious factor as in the side sheets of gondolas, the loss in thickness for the copper steel was about one-third as high as for the plain steel. Where the steel was subjected to severe mechanical abrasion as well as corrosion, the loss in thickness for the copper steel was about 60 per cent as high as for the plain open-hearth steel.

STEEL 9-25-30

FABRICATION:

Die Castings

Limiting factors and utility of die castings discussed by D. L. Colwell in Metal Progress, September 1930, *p.* 91, 5 *pp.*, 4 *illusts.*

Size, shape and price of material, raw material and quantity are classed as limiting factors and are discussed briefly. Utilization and physical properties of alloys of tin, lead, zinc and aluminum, commonly used as die-casting materials, are included in the discussion. Zinc base alloys now are cast in the largest tonnage, although the number of castings made of the aluminum base alloys probably is equal to the number of zinc-base alloys. The use of inserts in the die-casting process not only has improved the quality of the casting, but often has secured business in parts formerly made by more complicated production methods.

STEEL 9-25-30

Selecting Electrodes

Significance of specifications and time testing as a basis for classifying electrodes discussed by J. B. Green, in the Fusion News, (Fusion Welding Corp., Chicago), September 1930, *p.* 3, 2½ *pp.* 2 *charts.*

Chemical specifications, which do not include all the chemistry, often are worse than no specifications. Only when electrodes fall in widely different groups, is tensile strength alone a distinguishing quality. The melting time never should be written into purchasing specifications because it involves variables other than those in the electrode itself. Approval of a brand should rest on shop and laboratory tests involving both operating characteristics and weld properties as the requirements of the case may indicate. Various effects influenced by melting time are cited by the author to assist the testing engineer to compare brands of the same type.

STEEL 9-25-30

PRODUCTION:

Furnace Design

Practical rules applicable to furnace construction in the heat treating field discussed by J. C. Kielman, in Metal Progress, September 1930, *p.* 58, 6 *pp.*, 7 *illusts.*

Factors, which have been gained by experience, in designing various type furnaces are explained briefly by the author. The proper proportion of walls and roofs, the installation of hearths, flues, ports, stacks and door construction are discussed in detail. Ten practical rules for determining heating capacities are listed to serve as a guide in planning furnaces.

STEEL 9-25-30

High-Temperature Furnaces

Design of gas-fired reduction furnaces to operate above 2500 *degrees Fahr. discussed by W. F. Allen and G. J. O'Neill, in Industrial Gas, September* 1930 *p.* 26, 2¾ *pp.*, 3 *illusts.*

Carburetted water gas 0.67 specific gravity and with a thermal value of 530 B.t.u. is used as fuel. The crucibles loaded vary from 70 to 100 pounds, depending on the grade and type of ores being handled. The best results are obtained by allowing 12 hours to raise the temperature with 2-inch manifold pressure and at a rate of gas consumption of 1200 cubic feet an hour. The burner equipment consists of two manifolds of three burners each, one manifold on each side of the furnace, the burners staggered, each burner firing into individual combustion space under the hearth. The furnace is held at temperature from 24 to 28 hours, which requires a gas consumption of 840 cubic feet an hour at 1½ inches manifold pressure and 2750 degrees Fahr.

THE JOHNSON FRICTION CLUTCH

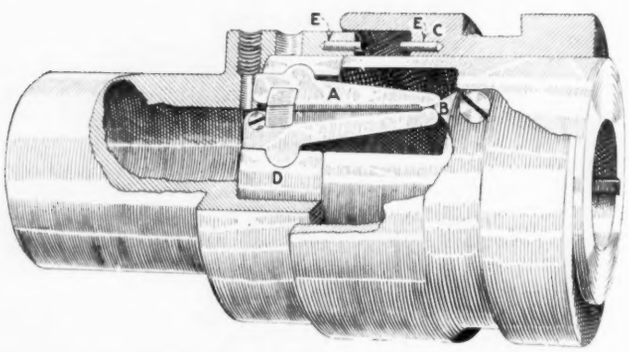
THE RELIABLE CLUTCH

THAT'S THE JOHNSON

CONSTRUCTION

The sleeve carries a curve-shaped wedge which spreads the chrome nickel steel levers when sleeve is moved forward and the levers being fulcrumed in the ring, expand the ring inside the cup. The frictional contact drives the cup, on the hub of which can be mounted standard steel split pulley, cone pulley or solid iron pulley for shafting drives. For short center drive, Sprocket or Tex-Rope pulley is used. When installed on machiney a Gear is more often mounted on hub.

THE NEW SUPER CLUTCH



The *improved* JOHNSON single clutch sectioned; showing chrome nickel steel adjusting blocks and adjusting screw lock in new chrome nickel steel fingers—A.

WIRE, PHONE Or

WRITE FOR CATALOG "WHITE—9"

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

Machine Tools and Plant Equipment

"Without machine tools modern machinery could not be built."

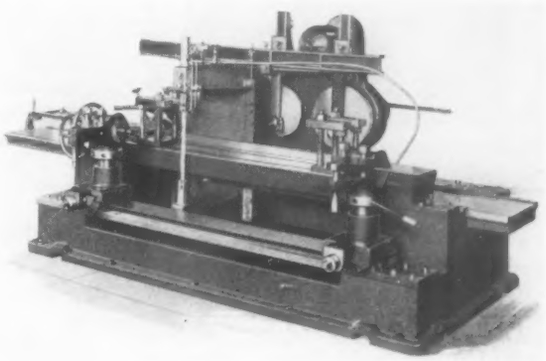
—Joseph W. Roe

Sawing Machine Built for Clover Leaf Billets

Peerless Machine Co., Racine, Wis., has built for the Firth Sterling Steel Co., McKeesport, Pa., a special metal sawing machine for cutting off the wings of a three-wing billet of so-called "clover leaf" design. The accompanying illustration shows the nature of the work performed.

The machine is designed so that the billet is laid lengthwise in two vises in front of the long table, in such a manner that one wing rests on the table. This wing is tnen additionally clamped by the two fixtures which are shown with springs on them. The saw frame carries the blade crosswise and operates the blade in that manner for a distance of more than 4 inches while reciprocating it up and down. At the completion of the cut the 10 x 10-inch wing, which is 4 inches long, is free and rests on the long table. The billet is then turned over and the next wing removed in a similar manner.

The rugged character of this machine is indicated by its weight, which is 8000 pounds. Although built to handle one particular job for one particular company, it serves to indicate the possibilities of specially designed heavy-duty sawing machines.



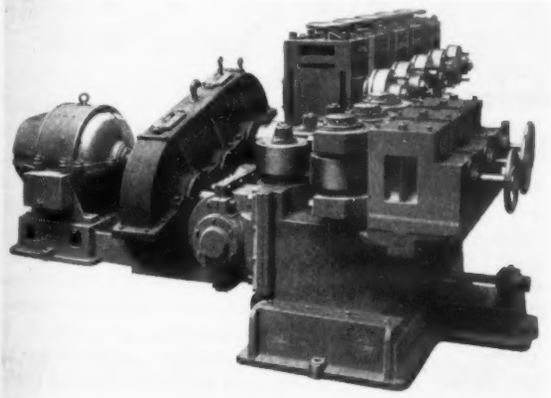
This rugged sawing machine, designed for cutting off wings of "clover-leaf" billets, indicates the possibilities of specially designed machines of this character for increasing production

◆

Two-Way Straightener Has Adjustable Rolls

Sutton Engineering Co., Park building, Pittsburgh, has brought out a roll straightening machine for bar stock of various sections, which incorporates a number of improvements. The straightener, an illustration of which accompanies this description, is a heavy-duty machine which will handle angles up to 6 x 6 x ½ inch, rails up to 60 pounds, and flats up to 6 x 1 inch, at straightening speeds from 250 to 350 feet per minute. It will also handle other sections of not over the same weight per foot as the above. It will handle small bars down to ½ x ¼ inch and all other sections of not less than the same weight per foot. The machine is arranged for motor drive, being furnished with motor pinion and motor base plate, but without electrical equipment. A motor of 125 horsepower, running at 600 revolutions per minute, is recommended.

The most important feature of the design is that straightening centers can be quickly and easily changed both in the case of the vertical and the horizontal rolls. By means of this adjustment, sections of either large or small size can be straightened properly on the same machine. When small bars are to be straightened, the resting blocks are brought close together, and as sections increase in size, these blocks are moved further apart. The machine has nine vertical and six horizontal rolls which permit a bar to be straightened on two axes in one pass. Tapered roller bearings are used throughout and all gears are enclosed and run in oil. One set of rolls, grooved as desired, is furnished with the machine, and extra sets for any class of material can be furnished extra. The approximate weight of the machine is 95,000 pounds and the floor space required—exclusive of motor base—is 17½ x 19 feet.



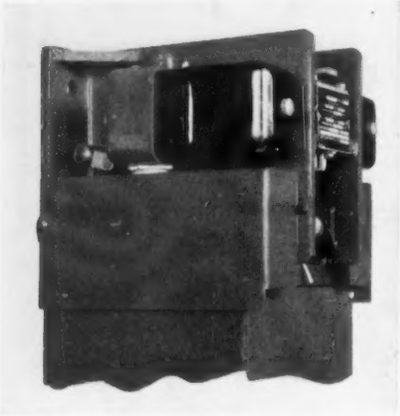
Nine vertical and six horizontal rolls, with adjustable resting blocks, permit either large or small sections to be straightened on two axes in this machine

◆

Solenoid Switchgears Give Trip-Free Operation

General Electric Co. Schenectady, N. Y., announces a new line of solenoid-operated direct-current switchgear mechanisms, which are trip-free at any point of the closing stroke. The trip-free feature is inherent in the design of these switches, one of which appears in the accompanying illustration.

The mechanism operates in conjunction with a control relay and remotely mounted control switch. Emergency manual operation is obtained by means of a removable manual closing device which can be assembled for operation either from the side or the front as desired. Features worthy of mention are the accurate and positive operation, noncorrosive main bear-



Trips-free feature is inherent in this solenoid switchgear

ings, provision for multiple-stage auxiliary switches conveniently located and operated by the solenoid mechanism, and terminal blocks located directly below the auxiliary switches, easily accessible by removing the enclosing cover.

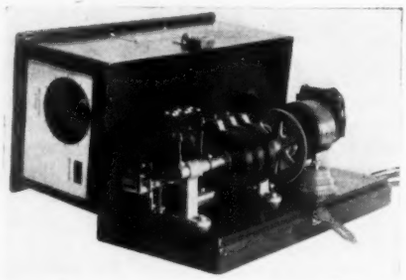
◆

Time Cycle Contactors Give Automatic Control

Automatic Temperature Control Co., 34 East Logan street, Philadelphia, has brought out a new line of time cycle contactors applicable to such uses as the automatic operation of furnace doors, advancing a load in a continuous type furnace, timing heating and electroplating operations, etc. The accompanying illustration shows a cycle stop type contactor designed to handle three contacts per cycle in a desired sequence.

In this particular instrument, accurate timing, and the power for operation, is obtained from a small synchronous motor geared to give the desired time of cycle. Change gears allow this timing to be altered as required. One of the operating cams is pinned to the camshaft, but the others are held by spring tension and are adjustable in relation to each other within the limits of the cycle. Provision is also made for shortening or lengthening the period of contact per cycle and quick make-and-break contacts can be provided. Progress of the cycle is indicated by an arm which travels around a graduated dial on a glass in one end of the instrument case. The counter records the number of complete cycles. Units of this kind have been built with cycles of only a few seconds duration, and have also been built with as many as 11 contact disks and with cycles lasting up to 96 hours.

These time cycle contactors also are built in models which do not require change gears to alter the time of cycle, this change being easily and quickly made by means of an adjusting knob on the outside of the instrument case. Motive power and means for accurate timing are obtained from a small double field synchronous motor, which moves an elapsed time contact arm clockwise or counter-clockwise, depending on which of the field coils are energized. This unit is built in both the cycle stop and the cycle repeating types. The placing of work in position for treatment mechanically pulls down a lever arm and throws the motor line switch to "on" position. This energizes one winding of the motor, so that the elapsed time contact arm, starting from zero, travels clockwise for the set time cycle. Upon completion of the cycle, the contact operates a signal or a motor-operated controller. The motor operating controller can be arranged to remove work automatically at the end of the cycle. In so doing, the lever arm can be pulled up by a spring, thus throwing the motor line switch to "off" position. When the next work is placed in position, the lever arm is again pulled down, throwing the line switch to "on" position, but this time energizing the other winding of the motor, so that the elapsed time arm travels counter-clockwise for the same time period, making contact at the zero position of the scale and repeating the signal or the automatic removal of the work.



Time cycle contactors can be used for timing heat treating

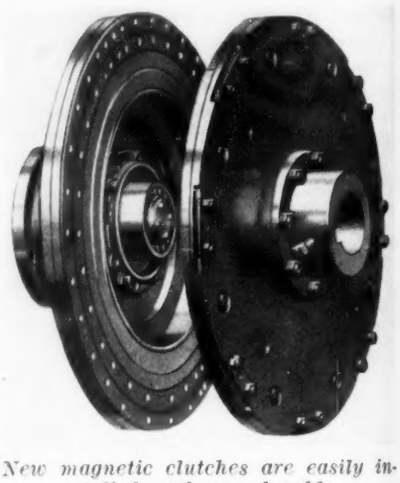
◆

Welding Rod Is Made for General Purpose Work

Cutler-Hammer Inc., Twelfth and St. Paul avenue, Milwaukee, announces a new line of magnetic clutches, of which one appears in the accompanying illustration. The manufacturer claims for these clutches easier installation, greater safety, and easier access to parts.

The shape of the armature cross section is that of the letter "L," in order to fit around the magnetic coil. This design is said to give stronger and steadier magnetic pull throughout the life of the lining. The coil is wound on a sheetmetal form and is vacuum impregnated before being inserted into the field member. It locks in place by means of four mounting studs, which extend through the field casting, and loosening these four studs allows removal of the entire coil. The terminals are recessed below the surface of the field member, which protects them against damage. A centering bearing of the roller type is mounted in the field member and protrudes into a recess in the armature hub, forming a common support for both clutch members in allowing either to revolve independently of the other when disengaged.

The collector rings of these clutches are made of brass to prevent corrosion and are mounted away from the hub on four insulating studs, so that it is practically impossible for sufficient dust to collect to cause creeping between the rings.



New magnetic clutches are easily installed and are durable

◆

Welding Rod Is Made for General Purpose Work

Wilson Welder & Metals Co. Inc., North Berger, N. J., manufacturer of arc welding wire in grades which are suitable for each particular metal and welding purpose, announces a new low-priced general-purpose rod especially recommended for general welding operations where medium ductility is required. This wire combines a fast and smooth flowing quality with good penetration and, it is claimed, will produce a weld of at least 50,000 pounds per square inch.

Scattering Steel Needs Encourage

No Decisive Trend Among Major Users but Sentiment Continues Good—Pig Iron Down at Pittsburgh—More Hopes for Rail Needs—Operations Steady

NONE of the major outlets for steel, such as the railroads or the automotive industry, as a group is displaying noteworthy interest in the market, but the aggregate of moderate, unrelated demand is encouraging and is maintaining sentiment buoyant.

Inquiry for heavy steel at Chicago, for example, is the largest in six weeks, and 50,000 tons of structural work is developing. As western railroads begin shaping up their budgets for 1931, prospects for track material needs are more favorable. Wire and fencing are moving better in the Northwest.

In the East, an important steel producer has booked 15 per cent more tonnage in the first 20 days of September than in August. In spite of slack automotive interest, improvement in the sheet, strip and cold-finished bar markets at Pittsburgh continues. Implement manufacturers are releasing more fourth-quarter bars.

As for several weeks, the price situation is a source of strength for steel producers. It still is true that actual advances are rare and there are no illusions concerning third-quarter earnings reports, due next month. But concessions are disappearing, and increasingly are large consumers endeavoring to cover ahead. A number of automotive parts makers offer contracts for unstated volume at current prices through April 1, without takers.

In pig iron the same inclination of consumers to cover ahead is apparent and in most districts it is believed present quotations represent bottom. An exception is Pittsburgh, explained by the fact that a lack of demand has prevented adjustments long in process in other districts. An inquiry at Pittsburgh for 10,000 tons of basic has developed a price of $17, valley, a reduction of $1, while foundry, malleable and bessemer have sold 50 cents down in small lots.

Cleveland blast furnaces have sold 16,000 tons of iron the past week, duplicating the week previous, while sales at New York totaled 13,000 tons. Improvement also is noted at Buffalo. A sale of 5000 tons of basic is reported at Chicago.

Largely for seasonal reasons, structural steel inquiry is not expanding as rapidly as a few weeks ago nor are awards as large, but an unusual volume of business is pending. The more active projects include 6000 tons each for the house of representatives office building at Washington and a penitentiary in New York, 500 tons for a glass plant at Los Angeles and 3600 for a state building at Columbus, O. Fully 100,000 tons in active structural business is before fabricators. This week's awards, at 35,492 tons, bring 1930 orders to date to 1,406,958 tons; a year ago awards totaled 1,630,977 tons.

The firmer market on plates in the East is accompanied by an inquiry for 7800 tons for the Brooklyn, N. Y., water system and expected fourth-quarter requirements for many railroads. At Chicago 20,000 tons of plate work, chiefly oil tanks, is out. Pittsburgh mills have reaffirmed present prices on wire, nails and wire rods, reduced annealed fencing wire and galvanized wire $1, advanced staples and other specialties 10 per cent.

Sinclair Consolidated Oil Co. has placed 25,000 tons of pipe with the Youngstown Sheet & Tube Co., while Continental Construction Corp. has awarded 24,000 tons to Republic Steel Corp.

New York Central is expected to inquire for 175,000 tons of rails, equaling its 1930 needs, about Oct. 15. The Pennsylvania inquiry may be delayed. An eastern carrier is closing on its 1931 rails. The Pere Marquette, with 13,600 tons, is the first western road in the market.

Steelmaking operations are fractionally weaker, averaging about 57 for the industry. Pittsburgh and Chicago mills at 55 per cent, Buffalo at 53, Cleveland at 50 and eastern Pennsylvania at 58 are unchanged. Birmingham mills have curtailed from 55 per cent to 50, and Youngstown mills are at 57 per cent, against 58.

Although steel prices are fairly-well stabilized, belated reductions at Pittsburgh lower the market composite of STEEL 8 cents, to $32.56.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (Sept. 24, 1930)	**$32.56**
Last week (Sept. 17, 1930)	**32.64**
One month ago (August, 1930)	**32.99**
Three months ago (June, 1930)	**33.53**
One year ago (Sept. 1929)	**36.50**
Ten years ago (Sept. 1920)	**69.28**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Sept. 24, 1930	Aug. 1930	June 1930	Sept. 1929
PIG IRON				
Bessemer, del. Pittsburgh	$19.76	20.26	20.76	20.76
Basic, valley	18.00	18.00	18.50	18.50
Basic, eastern del. eastern Pa.	18.25	18.00	18.75	19.85
No. 2 foundry, del. Pittsburgh	18.76	19.26	19.76	19.76
No. 2 foundry, Chicago	17.50	17.50	18.40	20.00
*Southern No. 2, Birmingham	14.00	14.00	14.00	14.00
**No. 2X, Virginia furnace	18.25	18.25	18.25	20.00
**No. 2X, Eastern del. Phila.	19.76	19.76	20.26	22.26
Malleable, valley	18.50	18.50	19.00	19.00
Malleable, Chicago	17.50	17.50	18.40	20.00
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	18.63	18.63	19.13	19.13
Ferromanganese, del. Pittsburgh	103.79	103.79	103.79	109.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12 to $13, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.60	2.50	2.50	2.65
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	31.00	31.00	31.25	35.00
Sheet bars, open-hearth, Pitts.	31.00	31.00	31.25	35.00
Billets, open-hearth, Pittsburgh	31.00	31.00	31.25	35.00
Wire rods, Pittsburgh	36.00	36.00	36.00	42.00

	Sept. 24, 1930	Aug. 1930	June 1930	Sept. 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.60	1.65	1.75	1.95
Steel bars, Chicago	1.70	1.75	1.85	2.05
Steel bars, Philadelphia	1.89	1.94	2.04	2.27
Iron bars, Chicago	1.75	1.80	1.90	2.05
Shapes, Pittsburgh	1.60	1.64	1.70	1.95
Shapes, Philadelphia	1.76	1.67	1.77	2.06
Shapes, Chicago	1.70	1.75	1.80	2.05
Tank plates, Pittsburgh	1.60	1.64	1.70	1.95
Tank plates, Philadelphia	1.80½	1.81	1.91	2.15
Tank plates, Chicago	1.70	1.75	1.80	2.05
Sheets, blue anl., No. 13, Pitts.	2.15	2.15	2.15	2.85
Sheets, black, No. 24, Pitts.	2.45	2.47	2.55	2.35
Sheets, gal., No. 24, Pittsburgh	3.00	3.09	3.20	3.50
Sheets, black, No. 24, Chicago	2.60	2.60	2.70	3.10
Sheets, blue anl., No. 13, Chicago	2.30	2.30	2.30	2.50
Sheets, galvanized, No. 24, Chi.	3.25	3.20	3.30	3.75
Plain wire, Pittsburgh	2.30	2.30	2.30	2.45
Wire nails, Pittsburgh	2.00	2.05	2.15	2.50
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.35
SCRAP				
Heavy melting steel, Pitts.	15.75	15.19	15.10	18.45
Heavy melting steel, eastern Pa.	13.00	12.50	13.25	16.38
Heavy melting steel, Chicago	12.25	12.00	12.05	15.05
No. 1 wrought, eastern Pa.	14.25	14.25	15.25	16.13
No. 1 wrought, Chicago	11.25	11.25	11.50	15.70
Rails for rolling, Chicago	14.50	14.50	14.55	17.60

Sheets

Business Better Than Month Ago, with Automotive Tonnage Still Lacking—Output Slower

SHEET PRICES, PAGE 69

Pittsburgh—Sheet business is making a more favorable showing than a month ago. Interest in future requirements is increasing. Little business is being received from automotive industry but a few others are increasing orders. The stove and range industry is more active and farm implement builders are commencing to order steel for spring equipment. Tank and drum makers continue steady buyers. Some inquiry still is being received for shipment beyond the fourth quarter. Prices are fairly steady in all grades except autobody. The market on the latter generally is 3.50c. Black sheets usually are 2.45c except in the Detroit district where extras on this material involve shading. Galvanized sheets are 3.00c to 3.10c. Blue annealed plates generally are 2.00c. A final decision remains to be rendered on the change in extras on full-finished material. It had been proposed to charge 35 cents per 100 pounds for both deep drawing and extra deep drawing material compared with the former rate of 25 cents and 50 cents, respectively.

Philadelphia—Sheet demand is slower but prices appear firmer at 2.00c and 2.15c for blue annealed and 2.45c for black. Galvanized, however, continue easy at 3.00c to 3.10c.

Youngstown, O.—As a result of slowing down in sheet orders independent mills have dropped operations to an average of about 48 per cent. The common grades continue fairly active. Shipments of black and galvanized are exceeding the August rate by considerable margin. Quotations show no change at 2.45c, Pittsburgh, for black; 2.00c to 2.15c for blue annealed; 3.00c to 3.10c for galvanized, and 3.60c for autobody.

Cleveland—In some instances September sheet tonnage will show a moderate increase over August; in others there will be a decline. Orders are not developing as fast as anticipated. The Fisher Body Corp. was expected to purchase material for 97,000 units, but has closed for only a portion of the sheet and strip tonnage needed for 55,000. At the rate of 400 pounds per car this is approximately 1100 tons. Orders of this size are taken at 2.35c, Pittsburgh, for black and 3.50c for autobody. Smaller orders for black bring 2.40c. On a 50-ton order for galvanized sheets for a building here 3.00c, base, Pittsburgh, failed to take the business. Blue annealed are 2.00c and 2.15c for No. 10 and No. 13 gage, respectively, by jobbing mills. Continuous mills go $4 a ton lower.

Cincinnati—The Middletown plant of the leading sheet producer reports operations at 100 per cent, with output of the company in all branches increased. The chief influence was from the automotive industry with better specifications also from radio and electric refrigerator makers.

Buffalo—Sheet mills continue to operate at about 50 per cent. Business from the metal furniture industry is showing marked improvement.

Chicago—Sheet mill tonnage is coming in slowly. Operations again have been reduced as one producer has decided to close down its ten hot mills at Milwaukee. The district rate is about 50 per cent. Mill prices are 2.55c for No. 24 black; 3.20c for No. 24 galvanized; 2.10c for No. 10 and 2.25c for No. 13 blue annealed. Chicago delivered prices are $1 a ton higher than mill quotations.

St. Louis—Sheets orders are the largest in volume in a number of weeks. Improvement is noted especially in demand for galvanized material. Prices are steady.

Birmingham, Ala.—Sheet production in this district continues at 50 per cent. Little change is noted in demand.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.45c
Detroit, delivered	2.76½c to 2.81½c
Philadelphia, delivered	2.74c
Gary, Indiana Harbor	2.55c
Chicago, delivered	2.60c
Birmingham, base	2.65c
St. Louis, del.	1.80½c

TIN MILL BLACK, NO. 28

Pittsburgh, base	2.70c to 2.80c
Gary, base	2.90c to 3.00c

GALVANIZED NO. 24

Pittsburgh, base	3.00c to 3.10c
Philadelphia, delivered	3.29c to 3.39c
Gary Indiana Harbor	3.20c
Chicago, delivered	3.25c
Birmingham base	3.20c
St. Louis, del.	3.45½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.15c
Chicago, district mills	2.25c
Chicago, delivered	2.30c
St. Louis, delivered	2.50½c
Philadelphia, delivered	2.44c
Birmingham	2.30c

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base	2.00c
Chicago, district mills	2.10c
Chicago, delivered	2.15c
Philadelphia, delivered	2.29c
St. Louis, delivered	2.35½c
Birmingham	2.15c

AUTOMOBILE NO. 20

Pittsburgh base	3.50c

FURNITURE NO. 24

Pittsburgh	3.60c to 3.70c

Tin and Terne Plate

Prices per 100-pound box Pittsburgh

Tin plate, coke base	$5.25
Gary, Ind., base 10 cents higher.	
Long ternes, 24, primes	3.55c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

Standard wire nails	$2.00 to 2.10
Cement coated nails	2.00 and 2.10
Galvanized nails	4.00 and 4.10

(Per pound)

Polished staples	2.60c and 2.70c
Galvanized staples	2.85c and 2.95c
Barbed wire, gal.	2.80c and 2.90c
Annealed fence wire	2.15c and 2.25c
Galvanized wire	2.60c and 2.65c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.30c
Spring wire	3.30c
Wire, delivered Detroit	2.53½c
Nails, delivered Detroit	$2.38½

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.75c
Struc., c.l., Chicago	2.85c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Steel Plates

Base, Pittsburgh	1.60c
Philadelphia, del.	1.80½c
New York, del.	1.88c
Boston, del.	2.05c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.88½c
Lackawanna, N. Y., base	1.80c
Birmingham, base	1.80c to 1.85c
Coatesville, Pa., base	1.70c
Pacific Coast, c.i.f.	2.15c to 2.25c
St. Louis, del.	2.00½c

Structural Shapes

Base, Pittsburgh	1.60c
Philadelphia, del.	1.76c
New York, del.	1.75½c to 1.85½c
Boston, del.	1.88½c to 1.98½c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.83½c to 1.88½c
Lackawanna, N. Y.	1.80c
Birmingham, base	1.80c to 1.85c
Pacific Coast, c.i.f.	2.25c
Detroit, del.	1.91½c to 1.96½c

Bars

SOFT STEEL

Pittsburgh, base	1.60c to 1.65c
Chicago, base	1.70c to 1.75c
Birmingham, base	1.80c to 1.85c
Lackawanna, N. Y., base	1.85c
Pacific Coast, c.i.f.	2.35c
Cleve. base, local del.	1.65c
Do, outside delivery	1.60c
Philadelphia, del.	1.89c to 1.94c
New York, delivered	1.98c
Boston, delivered	2.05c
Pittsburgh, cold finish	1.80c
Pittsburgh, forg. qual.	1.90c

RAIL STEEL

Chicago Heights	1.65c
Eastern mills	1.65c

IRON

Chicago, base	1.75c
New York, delivered	1.93c to 1.98c
Philadelphia, delivered	1.94c to 1.99c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c to 2.00c
Stock lengths, mill	1.65c to 1.75c
Chi. billet, over 500 tons	1.85c
30 to 200 tons	2.00c
Under 30 tons	2.45c to 2.85c
Chi., rail steel, over 30 tons	1.50c
Under 30 tons	2.10c to 2.50c
Philadelphia, cut lengths	2.04c to 2.09c

Cold-Finished Steel

Bars, Pitts., Chi., Buff., Cleveland	2.10c
Do, delivered, Detroit	2.20c
Shafting (turned, polished) Pitts., Buffalo	2.10c
Do, (turn., ground) mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets, 35c; plates 31c; bars 28c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E	Alloy Diff.	S.A.E	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80-1.10 Cr.	0.45
2300	1.50	5100 Chr. spring	0.20
2500	2.25	6100 bars	1.20
3100	0.55	6100 Spring	0.95
3200	1.35	Chr., Ni., Van.	1.50
3300	3.80	Carbon Van.	0.95
3400	3.20	9250 (flats)	0.25
4100 .15 to .25 Mo.	0.50	9250 (rds., sq.)	0.50
4600 .20-.30 Mo.			

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.75c
Hot strip 6 1/16 to 24-in., Pitts.	1.65c
Hot strip, bands 6 in. and under, Chicago	1.85c
Do, 6 1/16 to 24 in.	1.75c
Cooperage hoop, Pitts.	1.90c to 2.00c
Do, Chicago	2.00c to 2.10c
Cold rolled strip., Pitts., Cleve., 3 tons, over	2.35c to 2.45c
Worcester, 3 tons, over	2.60c to 2.70c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.30c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes boat, barge, Pitts	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 73 off

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

Eagle list ..... 73 off

MACHINE BOLTS

All sizes cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off

Tire bolts, 60, 10 and 10 off.

Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.

Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 73 off

***HEXAGON CAP SCREWS**

Milled ..... 80-10-5 off

Upset 1 in. diam. and smaller ..... 85-10 off

***SQUARE HEAD SET SCREWS**

Milled ..... 85-5 off

Upset 1 in. and smaller ..... 80-10-5 off

*Discounts dated Jan. 23, 1930

Cut Nails, Chain, Piling

Cut nails, c.l., mills	2.45c
Do, less carloads	2.55c
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	2.00c

Bars

Improved Interest Shown in West—Sellers Show Signs of Holding Price in Last Quarter

BAR PRICES, PAGE 69

Chicago—Adding to the improved outlook in bars and other heavy finished steel is more liberal release of fourth quarter specifications from implement makers. In recent weeks autumn implement prospects appeared extremely dull. Now possibility of fair autumn tillage tool orders looms. Large Western automotive parts makers also are adding to specifications. While bar mill operations are not being raised from the recent 60 per cent rate, slightly more tonnage has been booked than a week ago. One producer has the heaviest inquiries in six weeks. A few larger heavy steel users manifest interest in early 1931 needs. While buyers continue to seek bargain prices, mills assert fewer miscellaneous users are benefiting from preferred industry prices. Soft steel bar quotations are based on 1.70, Chicago.

New York—Shading of the 1.65c, Pittsburgh, price on commercial steel bars is becoming less prevalent. Such instances, in fact, are isolated and with sellers generally quoting 1.65c for fourth quarter, trend appears upward. Demand is showing slight improvement.

Philadelphia—Steel bar demand shows some falling off in the past week. Although 1.65c, Pittsburgh, is the asking price, in some quarters the bar market continues at a spread of 1.60c to 1.65c, Pittsburgh.

Pittsburgh—Bars continue dull with light automotive requirements the largest single factor in restricted demand. Consumers are showing some interest in fourth-quarter requirements but are slow to place contracts. Producers have made no official announcement on prices for that period but are willing to take tonnage on the basis of current prices. The market is 1.60c to 1.65c, Pittsburgh.

Cleveland—Indifferent progress has been made in booking fourth-quarter tonnage. The price from outside mills is 1.60c, Pittsburgh or Cleveland, but small amounts still carry the 1.65c, Pittsburgh, figure. Cleveland producer is making 1.60c for outside and 1.65c for local delivery. Mills enjoyed a better week in soft steel bar orders than has been their lot in several weeks past. More diversification is noted among orders, which are running some 10 to 15 per cent thus far in September ahead of August. Some parts makers are asking extension of present prices on unstated tonnages through first and in some cases second quarter of 1931.

Tin Plate Specifications Beginning to Slow Up

Tin Plate Prices, Page 69

Pittsburgh—A number of rush orders for tin plate still are being received and operations are holding close to 75 per cent. With the approach of the end of the busy season for tin plate makers specifications show their usual decline but consumption for the packing of the leading vegetables will be considerably better than estimates that were made during the midst of the recent drought. Tin plate production in anticipation of early 1931 requirements will not start for a number of weeks. Tin plate continues $5.25 per base box.

Youngstown, O.—The tin plate trade reflects the arrival of the usual dull manufacturing season, due to the ending of the canning season. Merely fill-in orders now appear to be the rule. Mills will soon start their usual winter's schedules in anticipation of heavy spring business.

Plates

Railroads Showing More Interest in Market—Oil Industry's Demands Are Quieter

PLATE PRICES, PAGE 69

New York.—The plate market is firmer at 1.70c, Coatesville, Pa., and for less than carload 1.75c is generally quoted. Demand is slightly more active, with railroads showing greater interest. The Lehigh Valley, Erie, Delaware, Lackwanna & Western, Delaware & Hudson and New York Central are among those now figuring on tonnage for fourth quarter. The Todd Shipyards Corp. is low on a fire boat for this city, but it is understood the bid has exceeded the appropriation. Eastern plate mill operations are up slightly to 55 to 60 per cent.

Philadelphia—Plate demand is sufficient to keep eastern mills operating at 40 to 60 per cent. The price tendency is firmer and 1.70c, Coatesville,Pa., is the usual minimum.

Pittsburgh—Plate tonnage lacks improvement. Little new business is appearing, although barges for the Gulf Refining Co. may take 1500 tons. Freight car business still is lagging while line pipe production continues to account for the largest individual tonnages of plates. The market continues 1.60c, with price announcement for fourth quarter still lacking.

Cleveland—Consumers see no necessity for contracting for plates for fourth quarter. Inquiries for small oil tanks require 50 to 150 tons at a time. Warren City Tank & Boiler Co., Warren, O., is in the market for 3000 to 3500 tons for tanks, stills and evaporators for orders booked recently from the Pure Oil Co., Toledo, O., and Sun Oil Co., Cleveland. Plates are 1.60c, Pittsburgh, with some effort made to get 1.65c for small tonnages.

Chicago—Plate mills stand alone in having backlogs. Operations at about 85 per cent lead finishing mills. While 18,000 to 20,000 tons of oil tank plates are on inquiry, action on much of this tonnage depends upon the decision in Oklahoma late this month as to whether more oil properties are to be drilled. About 1000 tons of tank plates have been closed for two small refinery projects. Buyers still press for lower prices. It is reported 1.65c, Chicago, is done for fair size orders, one outside plate mill having come into the market with a price figuring to that base.

Contracts Placed

3500 tons, tanks, evaporators, etc., Pure Oil Co., Toledo, O., and tanks for Sun Oil Co., Cleveland, to Warren City Boiler & Tank Co., Warren, O.

2000 tons, sheet piling, subway, Philadelphia, to Dravo Contracting Co., Pittsburgh.

1800 tons, pipeline for water system, Anacortes, Wash., to Puget Sound Machinery Depot, Seattle.

800 tons, coast guard cutter No. 54, to United Dry Docks Inc., New York, previously noted as low bidder.

165 tons, sheet piling, Honolulu Oil Co., to Pacific Coast Steel Corp., San Francisco.

100 tons or more, car barge, Canadian National railways, to Prince Rupert

Dry Dock & Shipyard Co., Prince Rupert, B. C.

Unstated tonnage, 2,750,000-gallon steel standpipe, 85 feet in diameter and 65 feet high, to cost $50,691 for Racine, Wis.; general contract awarded Freeman Mfg. Co., Racine. Unstated tonnage, 40,000-gallon water tower for Sharon, Wis., to cost $6925, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

Contracts Pending

7800 tons, 48-inch steel pipe for department of water supply, New York, for installation in Brooklyn. Specifications expected out shortly.

260 tons, 55,000 barrel tank for naval operating base, San Diego, Calif.; bids received.

Semifinished Orders Held to Prompt Needs

Semifinished Prices, Page 80

Pittsburgh — Semifinished steel continues in a dull market. Producers have named no prices for fourth quarter and consumers are showing little interest in requirements for that period. Current orders are confined to small lots for prompt purposes. The market usually continues $31 for rerolling billets, slabs and sheet bars. Forging billets and wire rods are $36.

Youngstown, O. — Recent slight stimulation of the strip trade has resulted in an increase in demand for billets. Slowness in the sheet sales has decreased sheet bar demand. Independent mills have 26 open-hearth furnaces active, of 53 units in this district.

Cleveland—Consumers of sheet bars, billets and slabs are not contracting for fourth quarter, but shipments will be made to them as specified, by their regular sources of supply. The leading merchant producer here continues to operate seven of its 14 open hearths. Prices are steady at $31, Cleveland and Youngstown.

Rail Shop Operations Quiet

Chicago & North Western railroad has suspended activity at its shops for six weeks. Chicago, Rock Island & Pacific resumed work at its shops last week after several weeks shutdown. The shops will employ 1400 men for the remainder of this month, when it is probable another shutdown will go into effect. Shops of the Chicago & Alton railroad, Bloomington, Ill., have been operating with a two-thirds force five days a week during most of this year.

Railroads

Only 60 Cars Placed—Inquiries Limited—New York Central to Buy 175,000 Tons Rails

TRACK MATERIAL PRICES, PAGE 69

Chicago—Pere Marquette's inquiry for 13,600 tons of rails for 1931 shipment is the first this season for western roads. Rail producers are encouraged over the outlook in that preliminary reports on 1931 rail budgets indicate that no curtailment in rail purchases apparently is contemplated. The district's rail mill operations have dropped sharply as the season's requirements are nearly filled. Only about 200 tons of miscellaneous rails was placed. Track fastenings departments received several hundred tons of specifications during the week, and it is indicated the Chesapeake & Ohio inquiry for 8000 to 10,000 tons of 1931 fastenings may be closed this week.

New York—Car buying continues at possibly the lightest rate in recent years, with little fresh inquiry contemplated. Locomotive demand includes 10 for the Central of Brazil. A leading southern trunk line has closed or is just about to close on its 1931 rail requirements. New York Central, it now is understood, will be in the market about Oct. 15 for 175,000 tons of rails.

Pittsburgh—Inquiry for track material still is confined mostly to small lots. Specifications are seasonally light but better activity is looked for within the next several weeks. Local car builders have added little to their backlogs during the past 30 days. Light rail demand continues quiet.

Cleveland—Chesapeake & Ohio has an inquiry out for 5300 kegs of track bolts, 2500 kegs of track spikes and 16,000 tie plates. The Pere Marquette recent inquiry for rails for 1931 delivery totals 13,650 tons, 10,000 tons of which are for domestic use, balance for Canadian.

Birmingham, Ala.—First specifications for rails, accessories, cars or other railroad products will arouse much interest among the mills. Producers will be in operation at the smallest sign tonnage is gathering.

Car Orders Placed

Illinois Steel Co., 10 roll transfer cars, to Lorain Steel Co., Johnstown, Pa.

Tennessee Copper Co., Copper Hill, Tenn., 50 acid cars, to General American Tank Car Corp., Chicago.

Locomotive Orders Placed

New York, New Haven & Hartford, 10 electric passenger locomotives, to General Electric Co., Schenectady, N. Y., to cost $2,000,000, and to be built at Erie, Pa.

Car Orders Pending

National Tube Co., 10 standard gage car trucks of 70 tons capacity.

Locomotives Pending

Central of Brazil, 10 locomotives of 2-10-4 type, bids asked; Romero Zander, director, Rio de Janeiro, Brazil.

Cold-Finished Contracts Slow Developing

Cold Finished Prices, Page 69

Pittsburgh—Demand for cold-finished steel bars showed a moderate gain during the week. Business from automotive interests, though still light, is heavier than a month ago while requirements of other industries show a slight gain. Fourth-quarter contracting is slow to get under way. Producers still name 2.10c.

Cleveland — Cold-finished bars' pickup so far has been nominal. Small orders prevail. Interest in fourth-quarter is negligible. Some automotive tonnage is placed each week but at best it is poor. Multigraph, adding machine and typewriter manufacturers all are placing small orders as needed and the 2.10c, Cleveland, price holds. Any lower figure is special due to large annual consumption.

Visit Steel and Wire Plant

Semi-annual inspection of the Worcester, Mass., plants of the American Steel & Wire Co., subsidiary of United States Steel Corp., was held last week. The delegation of inspectors was headed by President J. S. Keefe, and included C. F. Blackmer and J. F. Coakley, vice presidents; E. E. Stone, general purchasing agent; A. F. Allen, secretary-treasurer; J. C. Hopkins, superintendent of blast furnaces and open hearths; H. G. Baldwin, superintendent of order and warehouse department; A. H. Garry, auditor; B. H. Lawrence, chief engineer; L. J. Gray, assistant to the president. J. Lester Perry, district manager, conducted the visitors through the three plants.

Structural Shapes

Awards Again Mount After Last Week's Decline—Subway at Philadelphia Leads, 5000 Tons—Bridges Still Prominent in Awards and Inquiries—Prices Firmer

STRUCTURAL SHAPE PRICES, PAGE 69

New York—While there appears to be only a moderate decline in large tonnage lettings, the number of smaller structural steel contracts has increased. Prices are firmer on both fabricated and plain shapes, mills holding closer to minimum quotations. An office building at Washington will take 6000 to 8000 tons.

Boston—New England structural awards declined somewhat last week, although state bridges in Maine, 350 tons, a Kennebec river bridge in Maine, 627 tons, and state bridges in Maryland, 200 tons, were let. A 1300-ton bridge at Tyngsboro, Mass., is up.

Philadelphia—Shape demand reflects some improvement the past week. Eastern shape mills continue to operate 50 to 60 per cent. Recent shape price advance has not yet become fully established because mills in some instances have given customers an opportunity to close on pending tonnages at the old figures. On new business, however, they show an increasing tendency to stick to 1.70c, base, nearest eastern mill, on plain standard shapes and 1.70c, base, Bethlehem, on thin web wide flange shapes.

Pittsburgh—Plain shape specifications show little change since a month ago and remain in fair volume. Awards in this district continue light with inquiry also slow.

Buffalo—Awards of 575 and 400 tons, respectively, of structural material for a school and a bridge, are the largest reported this week.

Cleveland—Contracts are about to be awarded by Crowell & Little Construction Co., general contractor on the $400,000 Cleveland Clinic hospital building, involving 500 to 600 tons of steel. Delays still are reported in connection with Ohio state office building, Columbus, O., and numerous other jobs in this territory. Plans are about ready on a United States courthouse at Toledo, O., taking possibly a few thousand tons.

Chicago—Much preliminary structural work is appearing on engineers' boards. A survey shows 50,000 tons in prospective work, much of which cannot be regarded as active. Plain material prices are 1.70c to 1.75c, Chicago.

Birmingham, Ala.—Several fabricating shops here still are operating on full time.

Contracts Placed

5000 tons, subway, Philadelphia, to Dravo Contracting Co., Pittsburgh.

3470 tons substructure, state bridge, Maysville, Ky., to Dravo Contracting Co., Pittsburgh, $461,460.

2500 tons, building, Fidelity National Bank & Trust Co., Kansas City, Mo., to Kansas City Structural Steel Co., Kansas City.

2385 tons, state bridge, Maysville, Ky., suspension superstructure to John A. Roebling's Sons Co., Trenton, N. J., $720,600.

2200 tons, London Terrace tower apartments, Tenth avenue end of Twenty-third and Twenty-fourth streets, New York, to Levering & Garrigues Co.; Henry Mandel, builder; in addition to 2300 tons for Ninth avenue end, reported in Sept. 4 issue of STEEL.

1700 tons, bridges, routes 1, 4 and 6, section 6, Christie's lane to Hudson river bridge, New Jersey plaza, to American Bridge Co., Pittsburgh. George M. Brewster & Son Inc., Bogota, N. J., general contractor.

1250 tons, medical school dormitory, Columbia university, New York, to Hedden Iron Construction Co., New York; Marc Eidlitz & Son, general contractors.

1250 tons, 18-story apartment, West End avenue and Eighty-second street, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.

1200 tons, nurses' home, Brooklyn hospital, to George A. Just Co., Long Island City, N. Y., William Kennedy & Co., general contractors.

1100 tons, Mandeville street wharf, Board of Commissioners, New Orleans, to Lukens Steel Co., New Orleans; Bienville street wharf, 750 tons, awarded to Virginia Bridge & Iron Co., as noted last week.

1000 tons, bridge, Pacific Great Eastern railroad, Lillooet, B. C., to Dominion Bridge Co., Ltd., Montreal, Que.

950 tons, office building, Yonkers, N. Y., to Hinkle Iron Co., New York.

627 tons, Kennebec river bridge, Maine, to American Bridge Co., Pittsburgh.

850 tons, bridge, Coplay, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

806 tons, telephone building, North Orange, N. J., to Oltmer Iron Works, Hoboken, N. J.

765 tons, steam plant, West Virginia Hydroelectric Co., Boncar, W. Va., to Lackawanna Steel Construction Co., Buffalo.

700 tons, office building, Republic Bank & Trust Co., Dallas, Tex., to Austin Bros., Dallas.

575 tons, Hyde Park school, Niagara Falls, N. Y., to Buffalo Structural Steel Co., Buffalo.

500 tons, consolidated school, Kennett square, Philadelphia, to McClintic-Marshall Co., Pittsburgh.

500 tons, building for Globe-Democrat Publishing Co., St. Louis, to Mississippi Valley Structural Steel Co., Decatur, Ill.

500 tons, warehouse, Camden, N. J., for port commission, to McClintic-Marshall Co., Pittsburgh.

466 tons, power house, Union Electric Light & Power Co., Bagnelle, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.

460 tons, pier shed, Southern New Jersey port commission, Camden, N. J., to McClintick-Marshall Co., Pittsburgh, instead of 500 tons to Robinson Iron & Steel Co., Philadelphia, as noted last week.

440 tons, building, New York Telegram Publishing Co., New York, to Levering & Garrigues Co., New York.

425 tons, stores and theater, Stamford, Conn., to Hinkle Iron Co., New York.

400 tons, state highway bridge, Yates county, N. Y., to McClintic-Marshall Co., Buffalo.

375 tons, hospital and infirmary buildings, Wayne County Poor commission, Eloise, Mich., near Detroit,to Whitehead & Kales Co., Detroit; A. W. Kutsche Co., Detroit, general contractor; Aaron H. Gould, architect.

350 tons, state highway bridges, Maine, to Boston Bridge Works, Inc., Boston.

350 tons, bridge over Hoh river, Jefferson county, Washington, to Wallace Bridge & Structural Steel Co., Seattle; Union Bridge Co., Seattle, general contractor.

325 tons, parochial school, Jefferson avenue, Brooklyn, to George A. Just Co., Long Island City, N. Y.

325 tons, penthouse and 6-story dwelling, 9 East Seventy-first street, New York, to George A. Just Co., Long Island City, N. Y.; Herbert N. Straus, owner; Marc Eidlitz & Son, New York, general contractors.

300 tons, 6-story sanitarium, Green and Delphi streets, Brooklyn, N. Y., to George A. Just Co., Long Island City, N. Y.; William Kennedy & Co., general contractors.

300 tons, Union avenue subway for Chicago & North Western railroad, Chicago, to Mississippi Valley Structural Steel Co., Decatur, Ill.

240 tons, Hall building, 116-20 West Thirteenth street, New York, to George A. Just., Long Island City, N. Y.

200 tons, state highway bridges, Maryland, to American Bridge Co., Pittsburgh.

200 tons, bridge, Great Northern railway, Mission, B. C., to Western Bridge Co., Vancouver, B. C.

185 tons, apartment, Undercliff avenue and Washington bridge, New York, to Empire Architectural Iron Works, Bronx, N. Y.

180 tons, apartment, 101st street and Fourth avenue, Brooklyn, N. Y., to Kalper Iron Works, Brooklyn.

Awards Compared

	Tons
Awards this week	**35,492**
Awards last week	**27,288**
Awards two weeks ago	**47,615**
Awards this week in 1929	**33,183**
Av. weekly awards, 1930	**36,076**
Av. weekly awards, 1929	**42,213**
Av. weekly awards, Aug.	**40,884**
Tot. awards to date, 1929	**1,630,977**
Tot. awards to date, 1930	**1,406,958**

180 tons, stores and offices, for Richard Hudnut Co., 693 Fifth avenue, New York, to Passaic Iron Works, East Rutherford, N. J.
175 tons, apartment, Empire boulevard, Brooklyn, N. Y., to G. & M. Iron Works, Brooklyn.
170 tons, apartment, Fourteenth avenue, Brooklyn, N. Y., to Gaynor & Rosenbaum, Brooklyn.
160 tons, Pennsylvania railroad concourse, New York, to Robinson Iron & Steel Co., Philadelphia.
150 tons, apartment, Crescent street, Long Island City, N. Y., to Emilnick Iron Works, Astoria, N. Y.
150 tons, school, West Hempstead, Long Island, N. Y., to American Bridge Co., Pittsburgh.
145 tons, grade school, New Rochelle, N. Y., to Kues Bros. Iron Works, Bronx, N. Y.; C. A. Williams, general contractor.
100 tons, building at Akron, O., for Telling-Belle Vernon Co., Cleveland, to Burger Iron Co., Akron, O.

Contracts Pending

15900 tons, two cantilever high level bridges over Hackensack and Passaic rivers, in New Jersey, on which McClintic-Marshall Co., Pittsburgh, was low bidder; project laid over until next meeting of state highway commission.
6000 tons, addition, house of representatives office building, Washington.
6000 tons, Rikers Island penitentiary, New York.
4770 tons, state bridge, Carrolton, Ky.; American Bridge Co., Pittsburgh, low.
5000 tons, building in Los Angeles for Pittsburgh Plate Glass Co., Pittsburgh.
3600 tons, state office building, Columbus, O.; general contract to Struck Construction Co., Louisville, Ky., and Cincinnati, on its bid of $2,622,000, and not to T. R. Patterson Construction Co., Detroit, as noted last week.
3000 tons, Emipre Trade building, Montreal, Que., for John F. Hansen, Ernest Pitt & Co., 179 Craige street west, Montreal.
2800 tons, Professional Arts building, Boston; H. K. Ferguson Co., Cleveland, general contractor.
2500 tons, Steinmetz senior high school, Barry and Melvina avenues, Chicago; Midland Structural Steel Co., Chicago, low at $147,995.
2430 tons, state bridge, Paducah, Ky.; action deferred; International Steel & Iron Co., Evansville, Ind., low.
2360 tons, state bridge, Eggbers Ferry, Ky.; Vincennes Bridge Co., Vincennes, Ind., low.
1725 tons, state highway bridge, Canton, Ky.; Nashville Bridge Co., Nashville, Tenn., low.
1630 tons, three state highway bridges, Allegheny county, Pennsylvania.
1550 tons, state bridge, Smithland, Ky.; action deferred; Nashville Bridge Co., Nashville, Tenn.
1500 tons, dam gates for Rock Island, Wash., hydro-electric project; bids early in October.
1300 tons, bridge, department of public works, Tyngsboro, Mass.
1200 tons, apartment, Madison avenue and Ninetieth street, New York.
1085 tons, state bridge, Tyrone, Ky.; Virginia Bridge & Iron Co., Roanoke, Va., low.
890 tons, filtration plant, Youngstown, O.; general contract to Clemmer & Johnson Co., Akron, O.
864 tons, state bridge, Spottsville, Ky.; International Steel & Iron Co., Evansville, Ind., low.
700 tons, apartment, East Seventy-third street, New York.
620 tons, senior and junior high school, Washington, Pa.; bids in.
600 tons, theater and offices, Torrington, Conn.
600 tons, bridges for Minnesota highway commission.
560 tons, bridge over Los Angeles river at Atlantic avenue, Los Angeles; bids received.
550 tons, Cleveland Clinic hospital building, Cleveland; general contract to Crowell & Little Construction Co., Cleveland.
400 tons, International building, University of Chicago, Chicago.
400 tons, state bridge, Boonesboro, Ky.; action deferred; Vincennes Bridge Co., Vincennes, Ind., low.
300 tons, telephone building, South Orange, N. J.
250 tons, addition, Wheeling Corrugating Co., Philadelphia.
250 tons, garage, Autocar Co., Philadelphia, still pending; reported Sept. 11 as having been awarded Robinson Iron & Steel Co., Philadelphia.
200 tons, jail, Media, Pa.; general contract to Penn Steel Service Co.
150 tons, hospital at Elyria, O.; general contract to T. J. Hume, Lorain, O.
143 tons, hospital, Waltham, Mass.
100 tons, apartment, Baker and Pacific streets, San Francisco; bids being taken.
100 tons, bridge, Bartlett, N. H., bids in; 30 tons reinforcing steel to Concrete Steel Co., Boston; C. D. Marsh Construction Co., Woodsville, N. H., general contractor.
Unstated tonnage, bridge, Seaboard Air Line, Appomattox river, at Petersburg, Va.; South street underpass reinforcing steel to Kalman Steel Co.; Cornell-Young Co., general contractor.
Unstated tonnage, United States court house, Toledo, O.; plans about ready for issuance.

Concrete Bars

Award Total Is Largest Since May 8—New York Warehouse, 4500 Tons Leads — 2800-ton Power House Placed—Sewers, Bridges Are Important

REINFORCING BAR PRICES, PAGE 69

New York—Concrete reinforcing bar lettings are heavier topped by 4500 tons for the Lehigh Valley warehouse. Distributors here report that 1.70c, base, Pittsburgh, will be effective as a minimum Oct. 1 on stock length, making 2.35c for cut lengths, delivered New York in large lots. At present some sizable lots are reported figured rather low. Sewer work in the Bronx will take 400 tons, going to Concrete Steel Co., while sewers in Brooklyn, 1150 tons, were awarded Igoe Bros.

Buffalo—After some brisk covering of good sized tonnages the reinforcing bar market again is quiet. An inquiry for 100 tons for a Buffalo school job is the largest reported this week. Prices are irregular.

Boston—Small lots only are being awarded in concrete bars, aggregating about 250 tons last week. Several larger tonnages are pending. Competition remains pronounced and builders are looking for lower prices. Tyngsboro, Mass., opened bids on Tuesday for a 225-ton bridge. The hospital at Waltham, Mass., 135 tons, is also pending.

Pittsburgh—Concrete bar awards are less active. Pending and prospective work remains fairly large. Little large work is appearing in this district with interest currently centered upon the Cincinnati Union terminal project, requiring 4000 tons. The market on bars usually is 1.90c to 2.00c for cut lengths and 1.65c to 1.75c for stock lengths.

Cleveland—Action still is deferred on the larger concrete bar jobs in Cleveland and vicinity. A number of smaller ones has been placed, including the Elyria, O., sanitarium. Pending work includes Cleveland Clinic hospital, Higbee Co. department store, taking 100 and 310 tons, respectively, and several smaller ones.

Chicago—Reinforcing bar inquiries are falling off gradually after an active award period. General contractors awarded bars for four Cook county, Illinois, bridges and about 450 tons of bars were purchased for University of Chicago dormitories. A small amount of road work has been let. Rail steel bars for building are irregular, bids disclosing prices from 1.50c to 1.70c. Road work bars are

(Concluded on Page 77)

Awards Compared

	Tons
Awards this week	**13,179**
Awards last week	**3,777**
Awards two weeks ago	**4,797**
Awards this week in 1929	**4,400**
Av. weekly awards, 1929	**5,849**
Av. weekly awards, 1930	**6,914**
Average weekly awards Aug.	**6,461**
Total awards to date, 1929	**240,609**
Total awards to date, 1930	**269,664**

Strip

Hot Output Up at Chicago—Mills on Cold Still Drag—Quotable Prices Unchanged

STRIP PRICES, PAGE 69

Chicago—Hot-rolled strip mills during the week received more liberal releases from two of the large automotive concerns. Operations now are higher at about 60 per cent. Wide sizes of hot are quoted at 1.75c, Chicago, while narrow are 1.85c. Cold-rolled mills have received little new automotive business and are operating at a low rate. Quotations are on the basis of 2.35c to 2.45c, Pittsburgh-Cleveland.

New York—The approach of fourth quarter has resulted in little increase in demand for strip. Prices appear steady at 1.65c and 1.75c, Pittsburgh, respectively, for the two sizes. Cold-rolled strip is nearer 2.35c, Pittsburgh, than 2.45c, though the market may still be quotable at a spread.

Pittsburgh—Incoming strip steel tonnage continues slightly ahead of the August volume. A few miscellaneous consumers show a steady increase in their orders, including the radio equipment industry, but practically all buyers are placing orders only for current needs. Prices are fairly steady for fourth quarter on hot at 1.65c and 1.75c for the two sizes though shading of $1 a ton is heard on large lots. Cold rolled strip is 2.35c to 2.45c. Mill operations continue around 40 per cent for hot mills and 35 per cent for cold.

Cleveland—Automotive buying is by no means well sustained, with small orders ruling. Those cold-strip manufacturers depending upon the automotive industry exclusively only operate 35 per cent; others catering to a more diversified line run 50 to 75. Some are booking fourth-quarter tonnage in a quiet way at 2.35c, Cleveland. Small orders carry a 2.45c price. Hot is 1.65c and 1.75c, base, Pittsburgh, for wide and narrow. Some tonnage recently was booked at $1 a ton under those figures.

Warehouse Sales Show Pickup Sustained

Warehouse Prices, Page 91

New York—Jobbing demand is spotty. Some warehouse interests report a fairly substantial increase over last month, but others, including some of the larger, regard the gain as slight. Prices, though still subject to shading, are firmer.

Boston—Fact that so many small jobs are going ahead maintains a satisfactory situation for warehouses.

Philadelphia—Jobbers continue to complain of dull demand but have considerable to feel thankful for in that prices are firm and unchanged.

Pittsburgh—Demand is unchanged and still seasonally quiet. Bars, plates, and shapes are slow but sheets continue more active than a month ago. Orders are in small lots. Prices are unchanged.

Buffalo—Warehouses report their iron and steel sales continue somewhat below 1929 averages, but there has been an increase in the number of orders in the past ten days. Some sellers now are hopeful that betterment will continue through last quarter.

Cleveland—The sole redeeming feature of the current light movement of local iron and steel jobber material is the steadiness which apparently is common to both price situation and buying rates. Signs of weakness in either of these are exceedingly difficult to discern.

Cincinnati—Jobbers report an increased number of orders but of small tonnage. Volume, however, will likely pass that of August. Prices are unchanged.

Chicago—Steel warehouse sales are showing a more sustained pickup. Carload orders, which heretofore have been extremely scarce, now are more common. Larger warehouses report recent single orders of two to three carloads each. Prices are unchanged.

St. Louis—Warehousemen have reduced galvanized sheets from 4.85c to 4.60c and one-pass cold roll from 4.25c to 4.05c per pound. Otherwise quotations on standard commodities remain unchanged. Further moderate improvement in business, mainly seasonal in character, is reported by the leading jobbing interests. Buying is more diversified than heretofore. Roofing material is somewhat more active, and items for foundry machine shops are moving in larger volume. Manufacturers of road machinery are also reported taking more steel.

Operations Hold at About 55 Per Cent Capacity

Youngstown, O.—Operations are largely unchanged. Pipe production resumed at the rate prevailing two weeks ago. Steel production of the independents will again embrace 26 of the 51 open-hearth furnaces with bessemer output at 60 per cent. Steel corporation steel making is unchanged at 55 per cent of capacity. Between 50 and 60 independent sheet mills out of 120 will be in operation. Empire Steel plants will all be idle this week. Strip mill operations are at about the same level. Tin plate operations are about 70 per cent for the Corporation and 60 per cent for independents. Pipe mill output will be 70 per cent, with backlogs of the mills insuring operations at about this level for practically the balance of the year. Independent bar mills are operating 55 per cent and those of the Corporation 60.

Philadelphia—Operations of the steelmaking plants in the East are at approximately 58 per cent capacity. Plate mills are higher.

Pittsburgh—Ingot production continues around 55 per cent. Schedule of finishing mills are steady. Sheet output holds at 50 with tin plate at 75. Strip production remains at 40 with pipe lower at 50 to 65.

Buffalo—Operations hold at 53 per cent of open-hearth capacity with prospect of continuance at this rate for October. Steelworks executives say it is impossible to make worth while predictions of future operations owing to unusual day-to-day fluctuations in general business.

Cleveland—The 50 per cent ingot rate is continued from last week with 17 of 34 open-hearth furnaces of the district pouring. Otis Steel Co. has five on at its Riverside works and two basic furnaces at its Lakeside division. The Bourne-Fuller division of Republic Steel Corp. is unchanged.

Chicago—Ingot output is off slightly to about 55 per cent. While gains in ingot consumption are resulting, these are offset in part by declines in production of some finished products. Of the 36 steelworks blast furnaces in the district, 15 are in blast. Seventy of the 120 open hearths are in operation. Sheet mill production has been reduced about 10 points to 50 per cent.

Birmingham, Ala.—Temporary closing down of Ensley works of Tennessee Coal, Iron & Railroad Co., including rail mill, blooming mill, open-hearth furnaces, affects the operating rate now considered a little under 50 per cent capacity. Only 10 open-hearth furnaces are on.

Concrete Bars

(*Concluded from Page* 73)

steady at 1.65c, while bridge and culvert bars are 1.75c.

Contracts Placed

4500 tons, Lehigh Valley warehouse, Eleventh avenue, Twenty-sixth and Twenty-seventh streets, New York, to Jones & Laughlin Steel Corp.; Starrett Bros. & Eken Inc., general contractors.

2800 tons, dam and power house for Rock Island, Wash., hydroelectric project, to Pacific Coast Steel Corp., Seattle; Stone & Webster Co., general contractor.

950 tons, storm sewer, Avenue X and Coney Island section, Brooklyn, N. Y., to Igoe Bros., Newark, N. J.; Joseph de Gregory, general contractor.

700 tons, bridges, Christies lane to bridge plaza, New Jersey, to Concrete Steel Co., New York; George M. Brewster & Sons Inc., general contractor.

500 tons, factory for Procter & Gamble Co., Long Beach, Calif., to unstated interest.

450 tons, dormitories for University of Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

400 tons, sewer construction, Bronx, N. Y., to Concrete Steel Co., New York; Clements Contracting Co., general contractor.

380 tons, three Cook county, Illinois, bridges, through Paschen Bros. Inc., to American System of Reinforcing, Chicago.

308 tons, Cook county, Illinois, bridge, through E. J. Albrecht Co., to Concrete Steel Co., Chicago.

260 tons, addition to Rose Bowl, Pasadena, Calif., to unstated interest.

210 tons, telephone building, Avenue Y, Brooklyn, N. Y., to Joseph T. Ryerson & Son Inc., Chicago.

200 tons, apartment, 1861 Cherokee street, Los Angeles, to unstated interest.

200 tons, sewer construction, Brooklyn, N. Y., to Igoe Bros., Newark, N. J.

200 tons, addition to pier, naval operating base, San Diego, Calif., to unstated interest.

180 tons, garage, Standard Oil Co., Henry street, Brooklyn, N. Y., to Concrete Steel Co., New York.

150 tons, apartment, Ninth and Kingsley streets, Los Angeles, to unstated interest.

150 tons, Illinois road work, to Olney J. Dean Co., Chicago.

141 tons, substructure, state bridge, Maysville, Ky., to Dravo Contracting Co., Pittsburgh.

100 tons, plant addition, Carstens Packing Co., Tacoma, Wash., to Pacific Coast Steel Corp., Seattle.

100 tons, miscellaneous work, including 50 tons for sanitarium at Elyria, O., through T. J. Hume, Lorain, O., general contractor, to Truscon Steel Co., Youngstown, O.

100 tons, Illinois road work to Calumet Steel Co., Chicago.

100 tons, apartment, 939 South Serrano avenue, Los Angeles, to unstated interest.

100 tons, apartment, Dunsmuir street, Los Angeles, to unstated interest.

Contracts Pending

800 tons, road work in New Jersey; general contract to Consolidated Production Co.

733 tons, state bridges in Kentucky; 200 tons, substructure at Boonesboro, J. A. Krebs & Sons Inc., Knoxville, Tenn., low; 59 tons for substructure at Paducah, Union Bridge Construction Co., Kansas City, Mo., low; 197 tons, substructure at Carrollton, Pacific Bridge Co., Portland, Oreg., low; 36 tons for substructure at Smithland, Carter, Carter & Bradin, Clay, Ky., low.

400 tons, jail, Los Angeles; bids Oct. 8.

350 tons, apartment, Sunset boulevard, Los Angeles; bids being received.

301 tons, bridge over Los Angeles river at Atlantic avenue, Los Angeles; bids received.

280 tons, prison, Attica, N. Y., John Johnson Construction Co., Buffalo, low.

250 tons, Steinmetz senior high school, Barry and Melvina avenues, Chicago; bids Sept. 23.

225 tons, state bridge, Tyngsboro, Mass.

200 tons, apartment, 500 East Oxford street, Los Angeles; bids being received.

200 tons, apartment, Beverly boulevard and Gramercy place, Los Angeles; bids being received.

175 tons, Panama Canal work; bids open at Washington Oct. 6.

135 tons, hospital, Waltham, Mass.

100 tons, public school addition, Buffalo, bids closed Sept. 25 at board of education offices, Buffalo.

Pipe

Two Steel Pipelines Placed—Cast Grade Fair for Municipal Needs—14,000-ton Inquiry Out

PIPE PRICES, PAGE 91

Chicago—Municipal business in cast pressure pipe again has been stimulated. Milwaukee took bids Sept. 22 on 1000 tons of 16-inch. Several contract jobs of 8-inch, about 500 tons, were closed by Chicago board of public works. The Monroe street sewer in Chicago totals several hundred tons of sewer pipe. Niles, O., is in the market for 500 tons of 6 and 8-inch cast water pipe, and Hillsboro, Wis., closed on 200 tons of 6 and 8-inch cast. Detroit's 3100 tons of 8-inch cast pipe is pending; Lynchburg Foundry Co. is low. Prices in municipal tonnage are fairly strong at $45.20 to $46.20, delivered Chicago.

Boston—Worcester, Mass., has decided to use concrete instead of cast pipe, 4000 tons or more. Concord, N. H., is in the market for 8000 feet of 12-inch cast pipe and enough other inquiries are out to give fresh impetus to a lagging market. Private business still is good. Prices remain firm.

Worcester, Mass.—Worcester has rejected all bids for 19,500 feet of concrete pipe with steel lining for a water line from Quinapoxet pond to Kendall reservoir. Lock Joint Pipe Co., Ampere, N. J., was low at $235,000. New bids will be asked.

New York—Cast pipe inquiry and buying is light. Prices are unchanged on a basis of $36 and $37, eastern foundry. Scattered carload lots are moving in fair volume, but eastern cities are not active in the market. Several foundries have curtailed operations on some sizes. United States Pipe & Foundry Co. booked 1100 tons for Fishkill, N. Y. Federal Water Service Co. is inquiring for about 14,000 tons of 48-inch pipe for West Virginia, but is expected to buy only part during 1930.

It is learned here that Natural Gas Engineering Construction Co., Tulsa, Okla., has booked a contract for installing 200 miles of steel pipe between Kansas City and Des Moines, Iowa. The line is 20 or 22-inch diameter.

Pittsburgh—Awarding of two substantial pipe line contracts enlivens an otherwise dull pipe market. Sinclair Consolidated Oil Co. awarded 25,000 tons to the Youngstown Sheet & Tube Co. while Republic Steel Corp. was awarded 24,000 tons of 24-inch line pipe, for the Continental Construction Corp.'s line in Nebraska and Iowa. Standard pipe demand shows slight improvement but still is quiet.

Little activity is noted in oil country goods. Business in mechanical tubing and locomotive and boiler tubes continues at the recent quiet rate. Mill operations are off slightly at 50 to 65 per cent with lapweld mills at the higher rate.

Youngstown, O.—The 25,000 tons of 12-inch steel pipe placed with Youngstown Sheet & Tube Co., by Sinclair Consolidated Oil Co., for southwestern installation, will be seamless. This line will be 180 miles long. Jobbers place small orders for buttweld pipe to rebuild depleted stocks. Backlogs keep electric welding and lapwelding mills busy. Several months will elapse before they will have discharged present commitments.

Cleveland—Pipe mills remain active on large diameter pipe but buttwelding departments are badly in need of tonnage. Jobbers only place small orders as needed for replacement or for jobs under way.

Birmingham, Ala.—Fair buying is reported in cast pressure pipe with shipments still active. Stocks on shop yards is being held down. Lettings are still in sight, California promising considerable tonnage. Base price is firm at $37 to $38 on 6-inch and larger sizes. Development programs are being pushed and by year's end the capacity of dis-

Yes, orders are scarce but they're all marked "RUSH!"

BOLTS
EMPIRE
NUTS-RIVETS
WHEN that order you've worked on so hard finally comes through and you've got to have bolts in a hurry, remember Russell, Burdsall & Ward's great bolt plants at Port Chester, Coraopolis and Rock Falls . . . . . 24-hour delivery to most important industrial centers—overnight to many. The world's best known bolts—when you need them!
RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY
Rock Falls, Ill.
Port Chester, N. Y.
Coraopolis, Pa.

trict will have been materially increased.

Contracts Placed

1577 tons, 8 and 12-inch class 150 cast pipe for Los Angeles; allocated as follows: 637 tons 12-inch to American Cast Iron Pipe Co.; 32 tons 12-inch to United States Pipe & Foundry Co.; 545 tons 8-inch to Pacific States Cast Iron Pipe Co.; 363 tons 8-inch to National Cast Iron Pipe Co.

1100 tons, 10 and 6-inch cast pipe for Fishkill, Dutchess county, N. Y., to United States Pipe & Foundry Co.; J. P. Wells, Rochester, engineer.

500 tons, 8-inch cast pipe for several jobs, Chicago board of public works, to unstated foundries.

436 tons, 16-inch class B cast pipe for Glendale, Calif., to F. B. Gridley.

301 tons, 4 to 8-inch class C cast pipe improvement of La Jolla street, San Diego, Calif., to R. E. Hazard Contracting Co.

200 tons of 6 and 8-inch cast pipe for Hillsboro, Wis., to unstated foundry.

172 tons, 6 and 12-inch class B cast pipe improvement of Central avenue, Phoenix, Ariz., to unnamed interest.

118 tons, Onset fire district, Mass., with special fittings, to R. D. Wood & Co., Florence, N. J.

110 tons, 12-inch cast pipe for approaches, Hudson river bridge, New York, to United States Pipe & Foundry Co., East Burlington, N. J.

Steel Pipe Orders

25,000 tons, 12-inch steel pipe for Sinclair Consolidated Oil Co., to Youngstown Sheet & Tube Co., Youngstown, O.

24,000 tons, 110 miles of 24-inch electric welded line pipe, Continental Construction Corp.'s line in Nebraska and Iowa, to Republic Steel Corp., Youngstown, O.

Contracts Pending

10,000 to 14,000 tons, 48-inch cast pipe, Federal Water Service Co., for West Virginia; may buy but part of requirements this year.

3100 tons, 8-inch cast pipe for Detroit; Lynchburg Foundry Co., Lynchburg, Va., low bidder.

1000 tons, 16-inch cast pipe for Milwaukee; bids Sept. 22.

1000 tons of 16-inch class C plain cast pipe for Milwaukee; bids closed Sept. 23.

500 tons, 6 and 8-inch cast pipe for Niles, O.

300 tons, 8-inch cast pipe for Yonkers, N. Y.; bids Sept. 25.

100 tons, 24-inch cast pipe for Great Neck, Long Island, N. Y.; bids in.

Unstated tonnage, 8000 lineal feet, 12-inch cast pipe, for Concord, N. H.

Unstated tonnage, 7100 lineal feet of 6-inch and 5700 feet of 8-inch cast pipe for Woodruff, Oneida county, Wis.; has adopted plans for new waterworks system.

Unstated tonnage, 4720 lineal feet of 8-inch, 15,161 feet of 6-inch, 810 feet of 4-inch cast pipe, with 33 hydrants, etc., for Williams Bay, Wis.; bids close Oct. 10.

Steel Pipe Pending

Unstated tonnage, 19,500 feet steel lined concrete pipe for Worcester, Mass.; Lock Joint Pipe Co., Ampere, N. J., low at $235,000; bids rejected and new bids to be asked.

Wire

Gains Are Slow—Stir in Jobber Lines—Staple Price Up, Some Fencing Down at Pittsburgh

WIRE PRICES, PAGE 69

Chicago—Fair gains are reported in wire fencing and other common wire products. Jobbers have been moving stocks more actively, particularly in the Northwest where crop conditions are more favorable. It is indicated that with much of the harvesting out of the way some buying of nails and fencing products should result. Manufacturers' wire products remain decidedly slow. Steel electrical wire for farm power lines has dropped off. Pressure against prices continues but mills report the market $2.15, Chicago or Western mills, to jobbers for wire nails, and 2.35c for plain wire. Annealed fence wire continues at 2.25c to 2.35c.

Worcester, Mass.—Outside of the apparent move of retailers to replenish their depleted stocks of wire, the market is showing no strong trends. Production remains at about 50 per cent of capacity. Auto accessory manufactures are taking some shipments. Otherwise the general situation remains unchanged. Plain bright wire to dealers is quoted at 2.40c, base, Worcester.

New York—Nail buying remains sluggish, with the market easy at $2, Pittsburgh. Bright wire is unchanged at 2.30c, Pittsburgh.

Pittsburgh—Slow improvement is noted in demand for wire products. Restricted activity in general industrial operations is reflected in quiet demand for manufacturers' wire. Orders from automotive interests remain light. Producers have issued fourth-quarter prices with quotations unchanged on wire nails, plain wire, and wire rods. Wire nails are $2 to jobbers with plain wire 2.30c and wire rods $36. Some revisions have been made in quotations on other jobbers' products. Polished staples have been advanced 10 cents per 100 pounds to 2.60c while galvanized staples and galvanized barbed wire have been advanced a similar amount. Annealed fence wire and galvanized wire have been reduced 5 cents per 100 pounds.

Ceveland—Nail orders are slightly more numerous. While $2.05, Cleveland, has not entirely disappeared, more orders carry a $2 price and large quantities can be booked at $1.95. One order for ten carloads was placed here last Monday. Manufacturers' wire orders are fair and all producers appear to book these at 2.30c, Cleveland. For one or two producers selling here, last week was the best in the past eight or ten. Wire rod orders helped out, $36, Pittsburgh, being the price.

Bolt and Nut Takers Slow for Fourth Quarter

Bolt, Nut, Rivet Prices, Page 69

Pttsburgh—Slight improvement is noted in demand for bolts, nuts, and rivets. Sales still show little increase since the first of the month. Railroads continue light. Jobbers are not adding extensively to their stocks. Fabricating shops remain fair buyers of rivets. Fourth-quarter contracting is nearly complete with the market steady at 73 off for bolts and nuts and 2.75c for large rivets.

New York—Consumers are contracting for fourth-quarter requirements at prevailing prices, largely a formality which is having little bearing on a restricted volume of actual committments Local demand from warehouse continues sluggish with prices nearer 70 off list than the 65 discount.

Philadelphia—Fourth-quarter contracting features the bolt, nut and rivet market with bolts and nuts at 73 off list and rivets usually 2.75c, Pittsburgh. Current specifications show a fair improvement over the August rate.

Cleveland—A little progress has been made in booking fourth quarter nut, bolt and rivet contracts. Additional arrangements will be completed between now and Oct. 1. Some consumers will continue their policy of buying as needed since they fear no market advance nor difficulty in obtaining material. Producers operate 40 to 50 per cent.

Chicago—Conditions in the bolt, nut and rivet market are a shade better. Inquiries are developing although specifications have made no notable gain. Several implement makers are more cheerful over the prospects of autumn business than for some time. Fourth quarter contracting is nearly completed. Discounts are unchanged.

Adrian Foundry & Machine Co., Adrian, Mich., recently organized, is beginning production of nickel and chrome plating work.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$17.50
Pittsburgh, district fur.	18.00
Pittsburgh, delivered	18.63 to 19.13
Valley, furnace	17.00
Cleveland fur., local del.	17.50
Philadelphia, delivered	19.26 to 19.76
Virginia, furnace	17.75
Granite City, Ill., fur.	18.00 to 18.50
Buffalo, fur., local del.	18.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail Brooklyn	20.91
Buff., all-rail, Newark	19.28
Ala., Bir. fur., local del.	14.00
Alabama, del. Chicago	17.51 to 18.01
Alabama, del. St. Louis	17.42
Alabama, del. Cincinnati	15.19 to 16.19
Alabama, del. Cleveland	18.51
Ala., Phila., dock del.	16.75 to 17.25
Ala., Balt., dock del.	16.50 to 17.00
Alabama, New York dock	17.00 to 17.50
Ala., Boston dock del.	20.21
Tenn., Bir. base, local del.	14.00
Tennessee, del. Cin.	15.19 to 16.19
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	19.00
Buff., all-rail, Brooklyn	21.41
Buffalo, all-rail Newark	19.78
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	19.76 to 20.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	20.00
Eastern, del. Phila.	20.26 to 20.76

MALLEABLE

Chicago, furnace	17.50
Cleveland fur., local del.	17.50
Pittsburgh district fur.	18.50
Pittsburgh, delivered	19.13 to 19.63
Valley furnace	18.00
Buffalo fur., local del.	19.00
Eastern Penna., delivered	19.26 to 20.91
Granite City, Ill., fur.	18.00 to 18.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.36
Eastern Penn., del.	17.75 to 18.25
Buffalo fur., local del.	18.00
Montreal, delivered	22.50
Valley furnace	17.00

BESSEMER

Valley furnace	18.00
Pittsburgh, delivered	19.76

LOW PHOS

Valley fur., standard	27.00
Philadelphia, standard	24.76 to 27.79
Furnace, copper-bearing	23.00 to 23.50

GRAY FORGE

Pittsburgh district fur.	18.00
Pittsburgh, delivered	18.63 to 19.13

CHARCOAL

Lake Superior, del. Chicago	27.04

SILVERY

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$33; 16—$35.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.60
Connellsville foundry	3.50 to 4.85
New River foundry	6 00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell. basis.	5.50
Portsmouth, O., ovens, Connell. basis	5.50
Buffalo ovens	8.00 to 8.50
Detroit, ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross Ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.50 to 11.00
North African low phosphorus	10.50
Swedish basic, 65%	9.50 to 10.50
Swedish low phos.	11.00
Spanish, North African basic, 50 to 60%	9.50 to 10.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$12.50
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.50

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	27 to 28 cents
Indian, 48-50%	27 to 28 cents
Brazilian, 46-48%	25 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Marvland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Pet net ton

9 x 4½ x 2½	65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$31.00
Pittsburgh, bessemer	31.00
Youngstown	31.00
Cleveland	31.00
Philadelphia	36.30
Chicago	32.00
Forging, Chicago	37.00
Forging, Pittsburgh	36.00
Forgings, Philadelphia	41.30

SHEET BARS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00
Chicago	32.00

SLABS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

WIRE RODS

Pittsburgh, Cleveland	$36.00
Chicago	37.00

SKELP

All grades, Pittsburgh	1.65c to 1.70c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$99.00
*Ferromanganese, del. Pittsburgh	103.79
Spiegeleisen, 19-21%, domestic fur. spot†	33.00
*Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon. cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.15
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

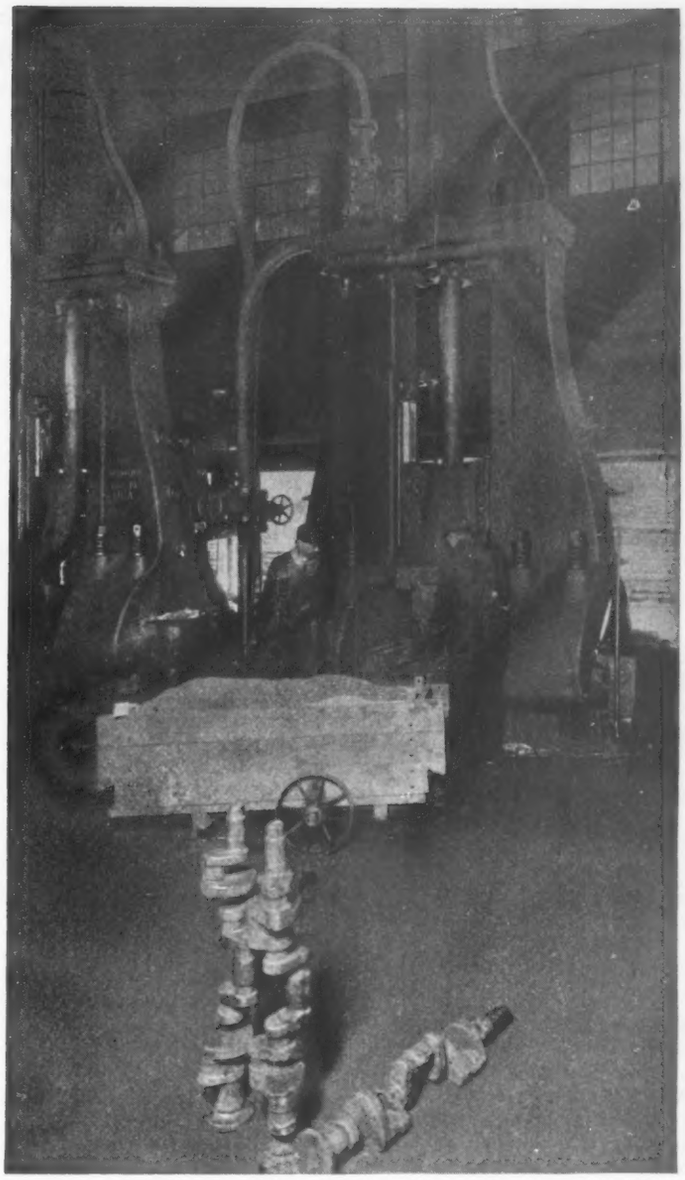
Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide, gross ton	19.50

Scene in forging shop of the STUDEBAKER CORP., South Bend, Indiana, showing crankshaft forging hammer, with dies of special Nickel-chrome-molybdenum steel, made by A. Finkl & Sons Co., Chicago.

Dependable materials are the best assurance of dependable performance



STUDEBAKER

gets longer life with Finkl die blocks made of

NICKEL ALLOY STEEL

"IN practically all of our important forging operations," writes the Studebaker Corp. of America, "Nickel-chrome-molybdenum steel dies are used. This fact alone should bear testimony to our belief in the superiority of this type of die. We find that Nickel-chrome-molybdenum steel dies serve our purpose more satisfactorily than other types because of their great depth of hardening, their resistance to wear and to cracking. Production men say that they are able to get many more forgings from the Nickel-chrome-molybdenum steel dies than from dies made of any other type of steel."

The severe service to which automotive crankshaft dies are subjected requires heat-treated steel of the highest mechanical properties. A. Finkl & Sons Co., manufacturers of these die blocks, state: "The blocks which we supply the Studebaker Corp. are the highest grade which we produce. This Nickel-chrome-molybdenum block has a reputation for toughness and durability and we attribute a large share of this to the Nickel content, which averages around 1.50%."

There is a Nickel Alloy Steel suitable for practically every heavy duty requirement. You are invited to communicate with our staff of engineers for detailed data on the selection of steel for your particular needs.

Nickel
FOR ALLOY STEEL

Send for List of Available Publications on Nickel and its Alloys

INCO NICKEL THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y. INCO NICKEL

Pig Iron

Valley Prices Are Reduced—Chicago Market Is Firmer—Basic Tonnages Are Booked

PIG IRON PRICES, PAGE 80

Pittsburgh—Prices of pig iron have declined as a result of continued poor demand. A recent inquiry for 10,000 tons of basic iron by a nearby steelmaker brought out quotations of $17, valley, and less, while foundry, malleable and bessemer iron have sold in small tonnages at 50 cents below recent market levels. This reduces basic $1 a ton to $17, valley, with No. 2 foundry $17.50, and bessemer and malleable $18. With the exception of the large basic order buying still is confined to small lots. A slight gain is reported by some interests in orders and shipments compared with August, but little interest is shown in forward needs. The Shenango Furnace Co. has closed its second furnace, placing all seven strictly merchant stacks in the valleys and Pittsburgh on the idle list.

Boston—Pig iron sales are fair, amounting to 1800 tons. The Universal Winding Co., Boston, purchased 400 tons of Buffalo No. 2X and No. 1X. Prices show firmness.

New York—Pig iron sales for the past week total 13,000 tons. Including the New England territory, it is estimated 12,000 tons is pending. Buffalo foundry iron is holding at $16, base, furnace, with waiving of differentials on higher grades in some instances. Southern iron still is $17 to $17.50, delivered, New York docks. Current inquiries include 375 tons of foundry iron for the A. P. Smith Mfg. Co., Bloomfield, N. J.; 150 tons of foundry for the Cincinnati plant of the Worthington Pump & Machinery Corp; 175 tons of foundry for the New York Central railroad, and 300 tons of low phosphorus iron for the Schenectady, N. Y., plant of the General Electric Co.

Some consumers are endeavoring to contract into next year but most sellers refuse to quote beyond fourth quarter. The Eastern Malleable Iron Co., Naugatuck, Conn., has closed for 3000 tons of malleable.

Buffalo—Reports from pig iron sellers are much better this week. Inquiries total 10,000 tons. Shipments this month have been small and considerable iron has accumulated since July 1. Prices are steady.

Cleveland—Furnace interests experienced another week of fairly good pig iron sales, those with headquarters in Cleveland booking 16,000 tons, practically the same as in the week preceding. Some melters are covering requirements for the remainder of the year, but consumption for the period evidently will be below normal. Some foundries are only contracting for iron in accordance with orders in hand. Business in the Cleveland territory has picked up slightly, while improvement is noted in the Michigan automotive industry. Shipments are ahead of the August daily average. A steel foundry at Alliance, O., is reported to have closed for 3000 to 5000 tons of basic, but Cleveland furnaces say they did no share in the order. Foundry and malleable iron continue $17.50, base, furnace, for local delivery, while lower is done in outside competitive territory.

Youngstown, O.—New sales of pig iron continue confined to small lots. Buyers do not appear interested in forward purchases. No. 2 foundry holds at $18, valley, and malleable and bessemer at $18.50.

Cincinnati—Pig iron orders are chiefly for immediate needs. Sales during the week reached 2500 tons. A 500-ton lot of southern iron was sold at about $11.50, base, Birmingham, the lowest reported here. Other sales were at $12 to $12.50. A Cincinnati melter is inquiring for 200 tons.

St. Louis—Deliveries are slightly higher than in August, though melters are taking only enough iron for immediate use. Stovemakers and tractor builders report an improvement in business. Interest in fourth quarter is almost entirely lacking. Sales are small. Prices nominally are unchanged, but shading is frequent.

Chicago—Firmness of pig iron prices is more general due to improved sales and the possibility of little or no more boat iron being shipped from the East this season. No sales were reported recently under $17.50, base, furnace, and prices of iron on docks also are stronger. Inquiry is fair, and sales are more numerous. A melter here has purchased 5000 tons of basic for its eastern plant, while 1000 tons of low phosphorus is pending. A middle western tractor plant closed for 2000 tons of foundry in the St. Louis district. It also purchased 400 tons of 8 per cent silvery iron at considerably less than published quotations. Merchant furnace production is at 65 per cent. Furnaces are picking up some iron to make shipments which have gained about 15 per cent over August. Foundries in this district are casting three to four days weekly, with operations over 50 per cent. A price of $11.50 on southern iron quoted here results from the waiving of silicon differentials, as the usual price is $12, Alabama furnace.

Philadelphia—The pig iron market is more active, sales including several thousand tons of basic. Considerable more basic is expected to be sold shortly. New inquiries include substantial tonnages of low phosphorus iron. Baldwin Locomotive Works, Philadelphia, is inquiring for 2000 tons of foundry iron for first quarter. Several smaller inquiries for foundry iron are noted from the Baltimore & Ohio railroad and Newport News Shipbuilding and Dry Dock Co.

Birmingham, Ala.—Pig iron business is disappointing and furnace stocks are increasing. Shipments are limited to small lots. A few inquiries for fourth quarter are coming from the East and Middle West. Prices are unchanged.

Toronto, Ont.—Spot and future sales show considerable improvement. A number of melters have covered fourth quarter needs. Individual tonnages continue light. Prices are steady.

Ferroalloy Shipments Show Moderate Increase

Ferroalloy Prices, Page 80

New York — Specifications for ferromanganese are slightly improved, with prices steady at $99, duty paid, tidewater, for lots of carloads to 500 tons annually. Domestic spiegeleisen, 19 to 21 per cent, is unchanged at $33, furnace, subject to differentials.

Pittsburgh—Shipments of ferromanganese show a moderate improvement and are slightly ahead of the rate a month ago. Little activity is noted in the spot market with prices continuing $103.79, delivered, for ferromanganese, and $33.00, furnace, for spiegeleisen. Activity in other ferroalloys continues light. Ferrotungsten is dull with the market nominally $1.15.

Chicago — September ferroalloy shipments are showing a gain of about 5 per cent over last month. No recent spiegeleisen sales have tested the carload price of $33, eastern furnace, 19 to 21 per cent grade.

Scrap

Scrap Production Slackens and Buying Continues Small Yet Prices Hold Fairly Well

Chicago—Scrap production and releases from industrial and country sources are being further reduced, yet the light collections are having no appreciable effect in strengthening prices. Consumer demand is spotty and restrictions on shipments are being tightened by several larger melters. Despite lack of market vigor, heavy melting holds fairly well. Reports are that small tonnages of selected grades have been sold at $13. Chicago & North Western's recent offering was bid in at about $12.60, delivered, Chicago switching district. Cast borings are fast becoming a drug on the market. A dealer offering at $7 has been refused. Reports are that efforts will be made to ship borings outside the district. Strength is shown in a few grades.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	10.50 to 12.00
Boston, dealers	9.00 to 9.25
Buffalo, No. 1	13.00 to 14.00
Buffalo, No. 2	11.50 to 12.00
Chicago	12.25 to 12.50
Cinci., deal.	11.25 to 11.75
Cleve., No. 1	11.75 to 12.25
Cleve., No. 2	11.00 to 11.50
Det., No. 1 deal.	11.25 to 11.75
Det., No. 2 deal.	9.50 to 10.00
E. Pa. del. mill	12.50 to 13.00
N. Y. del. R. R.	9.00 to 10.00
N. Y. deal. No. 2	6.25 to 6.75
N. Y., deal. yd.	6.00 to 6.50
Pitts. No. 1	15.50 to 16.00
St. L. No. 1 sel.	11.50 to 12.00
Federal, Ill.	11.25 to 11.50
Granite C., Ill.	10.00 to 10.25
Valleys, No. 1	15.00 to 15.50

COMPRESSED SHEETS

Buffalo, dealers	11.25 to 11.50
Chicago	10.25 to 10.75
Cleveland	11.50
Detroit, dealers	11.25 to 11.75
E. Pa. new mat.	11.50
Pittsburgh	15.00 to 15.50
Valleys	14.50 to 15.00

BUNDLED SHEETS

Buffalo	9.00 to 9.50
Cinci., deal.	9.50 to 10.00
Cleveland	9.00 to 9.25
Eastern Pa.	9.50 to 10.00
Pittsburgh	13.00 to 13.50
St. Louis	6.50 to 7.00

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	7.50 to 8.00
Detroit, dealers	8.00 to 8.50
St. Louis	6.50 to 7.00

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	7.50 to 9.00
Buffalo	16.00 to 16.50
Chicago (3 ft.)	13.50 to 14.00
Chicago (2 ft.)	14.00 to 14.50
Cinci., deal.	16.00 to 16.50
Detroit, deal.	15.00 to 15.50
Pitts. (open-hearth, 3 ft. and less)	17.50 to 18.00
St. Louis	14.50 to 15.00

STOVE PLATE

Birmingham	9.00 to 10.00
Boston, con.	8.00 to 8.50
Buffalo	10.25 to 10.50
Chicago, net	9.50 to 10.00
Cinci., deal. net	5.75 to 6.25
Det., net, deal	9.00 to 9.50
Eastern Pa.	10.00
N. Y., deal. mill	6.00
St. Louis	9.00 to 9.50

COUPLERS, SPRINGS

Buffalo	15.50 to 16.00
Chicago	13.50 to 14.00
Eastern Pa.	17.00 to 17.50
Pittsburgh	17.50 to 18.00
St. Louis	12.50 to 13.00

ANGLE BARS—STEEL

Chicago	13.00 to 13.50
St. Louis	12.00 to 12.50

LOW PHOSPHORUS

Buf., billets and bloom crops	16.50 to 17.00
Cleveland bil. and bloom crops	17.50
Eastern Pa.	17.50 to 18.00
Pitts. billet and bloom crops	20.00 to 21.00
Pitts. sheet bar crops	18.00 to 18.50

FROGS, SWITCHES

Chicago	13.00 to 13.50
St. Louis	12.50 to 13.00

SHOVELING STEEL

Chicago	12.25 to 12.50
Cleveland	8.00 to 8.50
St. Louis	11.25 to 11.50

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	10.00 to 10.50
Buffalo, No. 2	13.50 to 14.00
Chicago, No. 1	11.25 to 11.75
Chicago No. 2	12.25 to 12.50
Cinti., No. 2	11.25 to 11.75
Eastern Pa.	14.00 to 14.50
N. Y., No. 1 di.	10.00 to 10.50
Pitts. No. 2	15.50 to 16.00
St. L. No. 1	9.00 to 9.50
St. Louis, No. 2	11.00 to 11.50

SPECIFICATION PIPE

Boston	7.00 to 7.25
Eastern Pa.	12.00 to 12.50
N. Y., deal.	7.25 to 7.50

BUSHELING

Buffalo, No. 1	11.25 to 12.50
Chicago, No. 1	9.50 to 10.00
Cinn., No. 1 dl.	9.25 to 9.75
Cinn., No. 2	6.00 to 6.50
Cleve., No. 2	7.00 to 7.50
Detroit, No. 1 new deal.	9.50 to 10.00
St. L. No. 1	8.00 to 8.50
Val. new No. 1	13.75 to 14.25

MACHINE TURNINGS

Birmingham	7.00 to 8.00
Boston, dealers	3.75 to 4.00
Buffalo	8.50 to 9.00
Chicago	6.25 to 6.75
Cinn., deal.	6.25 to 6.75
Cleveland	6.50 to 7.00
Detroit	5.75 to 6.25
Eastern Pa.	9.00
N. Y., deal.	5.00 to 5.50
Pittsburgh	8.00 to 8.50
St. Louis	6.00 to 6.50
Valleys	10.50 to 11.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, chem.	9.00 to 9.25
Buffalo	9.00 to 9.50
Cinn., deal.	6.50 to 7.00
Cleveland	7.50 to 8.00
Detroit, deal	5.75 to 6.00
Eastern Pa.	7.00 to 8.50
N. Y., deal.	4.00
Pittsburgh	9.00

CAST IRON BORINGS

Birming., chem.	12.00 to 13.00
Birming., plain	7.00 to 8.00
Boston, chem.	9.00 to 9.50
Boston, deal.	3.50 to 4.00
Buffalo	9.00 to 9.50
Chicago	7.50 to 8.00
Cinn., deal.	6.50 to 7.00
Cleveland	7.50 to 8.00
Detroit, deal.	5.75 to 6.25
Eastern Pa.	8.50 to 9.00
E. Pa. chem.	14.00 to 14.50
N. Y., deal.	4.50
Pittsburgh	9.00
St. Louis	5.50 to 6.00

PIPE AND FLUES

Cinn., deal	8.00 to 8.50

RAILROAD GRATE BARS

Buffalo	9.25 to 9.75
Chicago, net	8.50 to 9.00
Cincinnati	7.00 to 7.50
Eastern Pa.	10.50
N. Y., deal.	6.50 to 7.00
St. Louis	10.00 to 10.25

FORGE FLASHINGS

Boston, deal.	7.25 to 7.60
Buffalo	11.00 to 11.50
Cleve. ov. 10 in.	10.00 to 10.50
Detroit	9.75 to 10.25

FORGE SCRAP

Boston, deal.	6.00 to 6.50
Chicago	14.50 to 15.00
Eastern Pa.	11.50

ARCH BARS, TRANSOMS

Chicago, net	13.00 to 13.50
St. Louis	13.00 to 13.50

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	11.50 to 12.00
Chi. steelworks	9.50 to 10.00
Cleveland	11.00 to 11.50
Eastern Pa.	11.50 to 12.00
Pittsburgh	12.50 to 13.00
St. Louis	9.25 to 9.75

STEEL CAR AXLES

Birmingham	16.50 to 17.00
Bos., ship. pt.	16.50 to 17.00
Buffalo	16.00 to 16.50
Chicago	16.80 to 17.35
Eastern Pa.	21.00 to 21.50
St. Louis	16.00 to 16.50

SHAFTING

Bos., ship. pt.	14.00
Chicago	16.25 to 16.80
Eastern Pa.	18.50
N. Y., deal.	13.00 to 14.00
St. Louis	13.00 to 13.50

CAR WHEELS

Birming., iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.50 to 14.00
Buffalo, steel	15.00 to 15.50
Chicago, iron	13.50 to 14.00
Chi., roll steel	14.50 to 15.00
Cincinnati	12.00 to 12.50
Pitts., iron	15.00 to 15.50
Pitts., steel	17.50 to 18.00
St. Louis iron	12.00 to 12.50
St. Louis, steel	14.50 to 15.00
E. Pa. steel	16.75 to 17.00
E. Pa. iron	14.50 to 15.00

NO. 1 CAST SCRAP

Birming., cup.	11.00 to 11.50
Buffalo (mac.)	11.25 to 11.50
Boston, textile	11.00 to 11.50
Chicago, mach.	13.45 to 14.00
Chi., railroad	11.20 to 11.75
Chicago, agri.	10.90 to 11.50
Cinn., mach. cup., gross	14.50 to 15.50
Cleve. cupola	13.50 to 14.00
Det., net deal	10.00 to 10.50
E. Pa. cupola	13.50
N. Y. cup. deal.	9.50 to 9.75
N. Y., del. local foundries	14.00
Pitts. cupola	14.00 to 14.50
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 ma.	11.00 to 11.50
St. L. No. 1	10.00 to 10.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. Mach. cast	13.50 to 14.00
Buffalo, break	8.50 to 9.00
Cleve., break	8.00 to 8.50
Detroit, auto, net deal.	11.50 to 12.00
Det., break., dl.	7.00 to 7.50
Eastern Pa.	11.50 to 12.50
N. Y. No. 1 dl.	8.00 to 8.50
N. Y. break. dl.	8.25 to 9.10
Pittsburgh	11.00 to 11.50

MALLEABLE

Boston R. R.	14.00 to 14.50
Buffalo	15.00 to 15.50
Chicago, agri.	11.75 to 12.25
Chicago, R. R.	13.50 to 14.00
Cinn., R. R. dl.	12.50 to 13.00
Cinn., agri., dl.	12.50 to 13.00
Cleve., rail	15.50 to 16.00
Det. auto deal.	13.50 to 14.00
St. Louis, rail	10.00 to 10.50

RAILS FOR ROLLING
5 feet and over

Birming. cup.	12.00 to 12.50
Boston	10.00 to 10.25
Buffalo	13.00 to 13.50
Chicago	14.50 to 15.00
Eastern Pa.	13.00 to 13.50
New York	9.50 to 10.00
St. Louis	13.25 to 13.75

LOCOMOTIVE TIRES

Chicago, cut	15.00 to 15.50
St. L. No. 1	13.00 to 13.50

LOW PHOS. PUNCHINGS

Chicago	13.00 to 13.50
Pittsburgh	17.00 to 17.50
Eastern Pa.	17.00 to 18.00
Buffalo	16.50 to 17.00

NOW—every length of Premier Welding Wire has the name and grade plainly stamped upon it. This means, not only the use of the *best* wire—but the unfailing selection of the *right* wire for every job to be done. All guess work has been eliminated—perfect results are assured every time.

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Pacific Coast Distributors; Columbia Steel Company, San Francisco Los Angeles Portland Seattle Honolulu

Export Distributors: United States Steel Products Co., 30 Church St., New York City

Cut 2-foot rail ends are stronger and an advance of 50 cents is quoted on steel angle bars.

Boston—Unexpectedly, prices for scrap took a turn downward during the week, which caught several sellers who had been holding out. The real reason for the decline appears to result from holding up orders on shipments that were scheduled to go ahead. Maine Central railroad has closed bids on a small supply of varied scrap.

New York—The tone in the local scrap market has lost some of its recent firmness, attributed in part to continued lack of fresh consuming demand and to an easier situation at Pittsburgh. Some tonnage recently contracted here for a shipment to Pittsburgh has been held up and there has been a drop in the price to around $9.70, New York, on Pittsburgh tonnage. This has resulted in a narrowing of the spread on No. 1 railroad steel to $9 to $10, New York, the outside price still being paid for barge shipments to Buffalo. Stocks at most eastern consuming plants are relatively light. Despite low stocks generally, it is understood that there is approximately 350,000 tons of various grades at the plants of the Bethlehem Steel Co.

Philadelphia — Recent sales of heavy melting steel aggregate approximately 15,000 tons, all at a $13 delivered price, now indicating the market in this grade. Otherwise current scrap business involves scattered tonnage at unchanged prices.

Buffalo—Buying continues small, but dealers think strengthening effect will be exerted by higher levels in other consuming centers. There are unconfirmed reports of purchase of No. 1 heavy melting steel at a price of $13.75, delivered Buffalo. Some No. 1 machinery cast has been sold at $11.25 also some stove plate at $10.50. Other prices are largely nominal but in some instances fractionally higher in dealers' quotations.

Pittsburgh—The market is quiet with no important buying noted over the past week. Heavy melting continues $15.50 to $16 on the basis of last sales but continued absence of several mills from the market detracts somewhat from the recent strong tone. Pennsylvania railroad list closing Oct. 1 includes 34,000 tons of various grades. Prices are generally unchanged throughout the list.

Cleveland—Iron and steel scrap is dull and unchanged this week with activity at minimum. A consumer of blast furnace material has released shipments, but these are in small volume and have had no appreciable effect on the market. Both cast iron borings and mixed borings and turnings hold at $7.50 to $8. Heavy melting steel is moving slowly. No. 1 is quoted $11.75 to $12.25 and No. 2 $11 to $11.50. Foundries are taking a few specialties, but total tonnage is negligible. Boat movement from Detroit has dwindled to an occasional cargo. Yard stocks here are heavy.

Cincinnati—Quotations on heavy melting steel remain unchanged although a curtailed market has created weakness. Dealers are offering slightly lower prices on grate bars, pipe, sheets, stove plate and turnings. Increased operating schedules in mills give hopes of imminent shipments.

Birmingham, Ala.—Small tonnages of a few items on the list are noted. Melters are buying against absolute needs. Dealers feel the weak market and one of the oldest in the business has had readjustment of affairs. Heavy melting steel is to be had in quantity, the price range being from $10.75 to $12 delivered. Consumers have but small lots in yards with one exception.

St. Louis—The market for scrap has developed a decidedly better undertone, especially in grades for steel mills. Purchasing has not expanded greatly, but it is evident that some of the chief steel interests are on the verge of commitments. Not a great deal of scrap is being offered, either by the carriers or industries. Shipments from the country have been in insignificant volume.

Toronto, Ont.—While prices remain unchanged, business is showing improvement in the iron and steel scrap markets. Sales for the week reached the highest level in more than a month, and inquiries are good. Mills are taking regular shipments of scrap on new order account and against contract. Prices are unchanged.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$15.00
Steel axles	13.00
Car wheels	11.00
Stove plate	10.00
Wrought pipe	5.00
Turnings	6.00
Heavy melting steel	8.00

TORONTO

Steel axles	10.00
Iron axles	12.00
Heavy melting steel	9.00
Turnings	6.50
No. 1 mach. cast (net)	11.00
Malleable (net)	9.00

Coke

Domestic and Industrial Orders Show Seasonal Improvement—Other Grades Moving Slowly

COKE PRICES, PAGE 80

Pittsburgh—Additional seasonal improvement is noted in demand for beehive coke for industrial and domestic purposes, but the market for furnace and foundry grades is quiet. Orders for foundry coke are slightly better than a month ago. Slow blast furnace operations are restricting demand from that source. Prices are steady.

Beehive coke production in the Connellsville district during the week ended Sept. 13 was 18,870 tons, compared with 17,430 tons the preceding week, and 82,740 tons the corresponding week of last year, according to the *Connellsville Courier*.

New York.—Spot furnace coke continues in slightly better demand, with prices steadier at $2.60 to $2.75, Connellsville, for the standard grades. Buying of beehive foundry coke, however, is quiet and unchanged at $3.50 to $3.75, Connellsville. Premium brands are holding at $4.85, Latrobe. By-product foundry coke is $9 to $9.40, delivered Newark, N. J.; $11, New England; and $9, Philadelphia.

Cincinnati—Only slight improvement is noted in demand for by-product foundry coke. Oven interests indicate this grade is firm at $9, delivered, Cincinnati.

St. Louis—New orders and shipments of coke so far this month are slightly above the average rate of August. Improvement in the melt at certain foundries is expected to make a still better record for coke the remainder of this month. Demand for domestic coke shows the usual seasonal increase.

Birmingham, Ala.—A small amount of coke s being shipped from this district. Production, however, is being curtailed. The base price of by-product foundry iron is held.

Pacific Coast

Business Improving Slowly—Mill Operations More Active—Seattle Company Books 2800-ton Reinforcing Bar Order—1000-ton Pipe Project Pending—Scrap Prices Show Weakness

Seattle—Business conditions in the Pacific Northwest are improving slowly. Sentiment in the iron and steel industry is more cheerful. Considerable new work of fair proportions is developing. Awards for the week are the best of the month, exceeding 5000 tons. Prices remain steady and unchanged.

Fisher Body plant, Seattle, has resumed operations after a month's idleness. Other factories are reopening. Highway construction is of unusual proportions throughout the territory.

Pig Iron and Coke

Foundry operations are slightly improved but there is only a limited demand for pig iron and coke as plants are fairly well stocked. No. 1 Columbia iron is unchanged at $24.50 and $25 for 100 ton lots and less, respectively. No European iron is being imported. British coke, which dominates this territory, is unchanged at $14 and $14.50, f.o.b. plant.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Pacific Coast Steel Corp., Seattle, booked the largest reinforcing bar award of the year, 2800 tons, for a dam and power house at Rock Island, Wash. The same producers are furnishing 100 tons for the addition to the Carstens packing plant, Tacoma. Mill prices of merchant bars are unchanged at 2.25c, and reinforcing at 2.30c. Operations at local mills are somewhat more active.

Puget Sound Machinery Depot, Seattle, has taken the general contract for the water system at Anacortes, Wash., requiring 1800 tons of plates for pipe. About 300 tons of cast iron pipe also is specified. Plate prices are 2.15c and higher, according to specifications.

The only important structural awards of the week went to Wallace Bridge & Structural Steel Co., Seattle, 300 tons for the Hoh river bridge, Jefferson county, Wash. The largest job pending involves 1500 tons for the dam gates at the Rock Island project. Mill prices on shapes are unchanged at 2.25c.

Wholesale jobbers report business improving, September showing a gain over August. Prices are unchanged. The largest pipe project pending is at Grant's Pass, Oreg., requiring about 1000 tons. Award is pending for the Mt. Scott water district, Portland, Oreg., requiring 12,400 feet of 4-inch pipe, 11,700 feet of 3-inch and 52,500 feet of 2-inch.

Old Materials

Steel scrap is unchanged at $9.50 to $11 a gross ton, local mills. Stocks are increasing and only the better grades are being shipped. Cast iron scrap is weak. Small lots are being sold at prices said to average $12.50 a net ton.

Awards Are Larger

San Francisco—(*By Air Mail*)—Demand for iron and steel products shows a little improvement. Featuring current awards is 1577 tons of cast iron pipe for Los Angeles. Most producers are maintaining prices at levels noted for the past month or two. Imports of iron and steel products on the Pacific coast during May, figures for which have just been received, show an increase in pig iron, cast iron pipe and tubular goods and a decrease in coke, bars and structural shapes. The aggregates follow:

	Tons May 1930	Tons April 1930	Tons May 1929
Pig iron	1,913	600	3,241
Coke	1,855	7,080	4,127
Bars	1,076	1,723	1,729
Shapes	2,424	6,306	1,817
Cast iron pipe	155	.....	3,157
Tubular products	1,031	710	3,252

Bars, Plates and Shapes

Current concrete bar awards total 2000 tons, including 500 tons for a plant in Long Beach for Procter & Gamble; 260 tons for an addition to the Pasadena Rose Bowl; 200 tons for a pier in San Diego, and 200 tons for an apartment in Los Angeles. Bids will be opened Oct. 8 for 400 tons for a new jail in Los Angeles. Bids have been opened on 301 tons for a bridge over the Los Angeles river, Los Angeles. Prices remain firm at 2.50c, base, on carload lots out of stock, both in the San Francisco and Los Angeles districts. Merchant bar steel holds at 2.35c, c.i.f. This material continues to move in small lots only. The only pending plate project of importance calls for 260 tons for a 55,000-barrel tank for the naval operating base, San Diego. Prices range from 2.15c to 2.25c, c.i.f.

The Pacific Coast Steel Corp. booked 165 tons of sheet piling for the Honolulu Oil Co., San Francisco. Bids have been opened on 560 tons for a bridge over the Los Angeles river, Los Angeles. Plain shapes range from 2.15c to 2.25c, c.i.f.

Other Finished Material

A number of important cast iron pipe lettings are reported. Los Angeles placed 1577 tons as follows: To the American Cast Iron Pipe Co., 637 tons; to the Pacific States Cast Iron Pipe Co., 545 tons, and to the National Cast Iron Pipe Co., 363 tons. Beverly Hills awarded 436 tons to Franklin B. Gridley. Phoenix, Ariz., placed 172 tons with an unknown company.

Europe Finds Business in General Recession

(*Concluded from Page* 24)

and steel production is decreasing. The domestic demand is shrinking.

ITALY, like every other country, is feeling the effects of the general depression. Unemployed at the end of July numbered 342,000. Both imports and exports have fallen. The government has set on foot a program of public works, the harnessing of water power and road and railroad construction. Production of pig iron during the first half year was 263,389 metric tons, against 342,112 tons in the first half of 1929; steel tonnage was 893,879 tons, compared with 1,100,149 tons.

Economic conditions in Sweden, after reflecting considerable vitality in the face of present world conditions, have deteriorated this summer. Iron and steel production has slowed down, and the markets are dull. Exports of iron ore, which had reached high figures at the end of 1929, are less important now.

Activities in Spain are marking time; here again, iron ore exports are adversely affected by the restriction of iron and steel production in all producing countries. Trade generally is dull and not up to the mark for the time of year.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2 points less. Wrought iron pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal
½	58	44½	½	23	5
¼	62	50½	¾	28	11
1—3	64	52½	1 and 1¼	31	15
			1½ and 2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7 and 8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7 and 8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill

Random lengths over 5 ft.....55%
Selected lengths, 1 to 18 ft.....53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. $37.00 to 38.00
Four-inch, Birmingham 41.00 to 42.00
Four-inch, Chicago ..... 49.20 to 50.20
Six to 24-inch, Chicago 45.20 to 46.20
Six-inch and over, N. Y. 38.50 to 40.50
Four-inch, New York .... 41.50 to 42.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga..	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.85c
Detroit	3.00c
Houston	3.00c
Los. Ang.	3.40c
New York††	3.10c
Philadelphia .	2.70c
Pittsburgh	2.75c
Portland	3.15c
San Frans. ..	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.00c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga..	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York††	3.10c
Philadelphia .	2.70c
St. Louis	3.15c
Tulsa	3.65c

REINFOR. BARS

Baltimore	2.50c-3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga..	3.10c
Cincinnati	3.15c
Cleveland	2.25c-2.44c
Detroit	2.30c-3.00c
Houston	3.00c
Los Ang. cl ..	2.40c
Los Ang. lcl ..	2.70c
New York	2.65c-3.10c
Philadelphia .	2.55c
Pittsburgh	2.75c
San Fran. cl .	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los. Ang.	3.40c
New York	3.10c
Philadelphia .	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran. ..	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles..	3.40c
New York	3.30c
Philadelphia .	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

NO. 10 BLUE

Baltimore	3.50c
Bost. 3/16-in..	3.915c
Buffalo	3.50c
Chattanooga..	3.60c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.10c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
New York	3.40c
Portland	4.00c
Phila. *†	3.15c
Pitts.**	2.75c-2.85c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.95c

NO. 24 BLACK

Balt. *†	3.75c
Boston	4.70c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	4.05c
Clev. ***	3.75c
Detroit	3.95c
Los Ang.	4.70c
New York	3.55c to 3.65c
Phila. *†	3.70c
Pitts.**	3.40c-3.50c
Portland	5.00c
San Fran.	4.35c
Seattle	5.00c
St. Louis	4.05c
St. Paul	3.545c
Tulsa	4.45c

NO. 24 GAL. SHEETS

Balt.*†	4.25c
Boston	5.45c
Buffalo	4.40c to 4.60c
Chicago (lc. del.)	4.35c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***..	4.35c
Detroit	4.40c
Houston	5.40c
Los Ang.	5.10c
New York	4.25c
Phila. *†	4.25c
Pitts.**	4.00c-4.10c
Portland	5.50c
San Fran.	5.00c
Seattle	5.50c
St. Louis	4.60c
St. Paul	4.23c
Tulsa	5.35c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.50c
Chattanooga..	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.10c
Det. 3/16-in. & lighter	3.30c
Houston	3.65c
Los Ang.	4.30c
New York	3.40c
Philadelphia .	3.00c
Pittsburgh	3.10c
Portland	3.50c
San Fran. ..	3.75c
Seattle	4.15c
St. Paul	3.75c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.65c
Det. No. 14 & lighter	3.80c
New York	3.75c
Philadelphia .	3.25c
Pittsburgh	4.10c
Seattle	5.15c
St. Paul	3.70c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.50c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San. Fran.(a)	4.25c
Seattle (a)	4.75c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100-in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
Phila. (c)	4.85c
New York	5.05c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

††Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

The Behavior of Bends must be Better than good-

when the un-expected happens

THE time to make sure that the piping, particularly the bends, will stand up and take the punishment incident to sudden changes in operating conditions—is when the pipe is selected for the job.

Skillful design and expert installation will not compensate for inadequate material. The foundation of successful pipe performance is—advanced methods of manufacture and complete understanding of the service requirements.

The "NATIONAL" organization has consistently worked side by side with power specialists in developing piping material that will answer every rigid requirement of modern practice.

Whether welded or seamless material, there is only one standard of quality. Both are backed by the most exacting standards in manufacturing methods . . . a system of testing and inspection of acknowledged thoroughness, and the judgment of America's leading power plant specialists whose continued preference for NATIONAL has made it—

America's Standard Wrought Pipe

NATIONAL TUBE COMPANY
Subsidiary of United States Steel Corporation
PITTSBURGH, PA.

NATIONAL PIPE
WELDED OR SEAMLESS

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 10.50c, del., Conn. for copper

Sheets	
Yellow brass (high)	17.37½
Copper, hot rolled	20.25
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-lb. base)	9.50
Tubes and Pipes	
Seamless yellow brass (high)	22.25
Seamless copper	22.50
Rods	
Yellow brass (high, full turnings)	15.62½
Naval brass	17.75
Anodes	
Copper, untrimmed	17.75
Wire	
Yellow brass (high)	17.87½

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	7.25 to 7.50
Chicago	7.00 to 7.25
Cleveland	8.00 to 8.25
St. Louis	7.75 to 8.00
Heavy Yellow Brass	
Cleveland	5.00 to 5.25
Heavy Copper and Wire	
New York	8.25 to 8.50
Boston	8.25 to 8.50
Chicago	8.25 to 8.50
Cleveland	7.50 to 8.00
St. Louis	8.25 to 8.50
Red Brass Borings	
New York	6.75 to 7.25
Yellow Brass Tubing	
Cleveland	5.00 to 5.25
Light Copper	
New York	7.00 to 7.50
Chicago	6.25 to 6.50
Cleveland	7.00 to 7.50
St. Louis	8.00 to 8.25
Light Brass	
Boston	3.75 to 4.00
Chicago	4.25 to 4.75
Cleveland	3.50 to 4.25
St. Louis	4.50 to 4.75
Zinc	
New York	2.25 to 2.50
Cleveland	1.75 to 2.00
St. Louis	2.25
Aluminum	
Clippings, soft, Cleveland	12.00 to 13.00
Clippings, hard, Cleveland	8.00 to 9.00
Borings, Cleveland	5.00 to 5.50
Cast, Cleveland	7.50 to 8.00
Cast, Boston	6.50 to 7.00
Cast, St. Louis	7.50

Secondary Metals

Remelt aluminum No. 12	14.00 to 15.00
Brass ingot, 85-5-5-5	10.75

Metals

Brighter Outlook Develops in Copper as Market Settles to Single-Price Level—Sales Lag

New York—A brighter outlook for the copper market has developed and this fact is lending encouragement to sellers of other nonferrous metals. The turn of the week has resulted in a slightly larger demand for red metal while prices are holding at a flat level for the first time in many weeks. Recent uncertainty, caused in large part by a ruling spread quotation, is still evident but not to such a marked degree as a week ago.

Copper—The downward revision of asking prices to 10.50c, Connecticut, by producers other than custom smelters at the close of last week brought the market to a single price level for the first time since Aug. 20 when the market in general was at 10.75c, Connecticut. Custom smelters had been quoting 10.50c for a week prior to the other producers' action. Copper and brass mill interests recognized the 10.50-cent level of custom smelters previous to the reduction of other producers by a general cut of ¼-cent in product prices, effective as of Sept. 17. The pace was set in the products market by independent companies. Some fair-sized orders for copper have been booked for domestic shipment while export sales so far this month have amounted to about 45,000,000 pounds, the larger producers report. Copper demand for both export and domestic consumption still is restricted mostly to immediate requirements.

Tin—Easiness in prices abroad has caused further declines in this country. Buying still lags here. The Tin Producers' association of London now reports that curtailment is taking effect and that the total world's supply of tin for the eight months ended Aug. 31 was 113,379 tons against 122,035 tons for the corresponding period of last year.

Zinc—Prices have held fairly steady but the tendency toward easiness has been a weakening factor in the market, especially in the face of very light demand from consumers. A cut in bids of $2 a ton in the Joplin concentrate market also has contributed to the weakness of the metal market. The outlook still is uncertain.

Lead—Some buying of lead has been done daily, mostly in carlots for immediate shipment. Prices have held unchanged and the market steady. Much metal remains to be bought for October requirements.

Antimony—Prices eased off in a dull market at the turn of the week despite a pickup in buying interest a few days earlier.

Aluminum—Prices continue unchanged and shipments slow.—*Daily Metal Trade.*

Coke By-Products Quiet; Napthalene Prices Down

New York — Naphthalene prices have been marked down by several refiners, flakes for next season's business being quoted at 3.75c to 4.75c. Balls range 1 cent higher. The new prices average about three-quarters of a cent a pound under old prices.

Distillate prices are unchanged, but firm. Demand for benzol, toluol and xylol holds up well. Output has been restricted and supplies are light. Frequent predictions are made of higher prices. Phenol is slightly more active with the bulk of business going at 17.00c. Sulphate of ammonia is being shaded.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Delivered	
Sulphate of ammonia	$1.80

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
Sept. 17	10.62½	10.75	10.25	29.90	30.20	5.50	5.35	4.25	22.90	7.75	35.00
Sept. 18	10.62½	10.75	10.25	29.80	30.20	5.50	5.35	4.25	22.90	7.75	35.00
Sept. 19	10.50	10.62½	10.18¾	29.62½	29.95	5.50	5.35	4.25	22.90	7.75	35.00
Sept. 20	10.50	10.62½	10.18¾	29.50	29.80	5.50	5.35	4.25	22.90	7.62½	35.00
Sept. 22	10.50	10.62½	10.18¾	29.25	29.75	5.50	5.35	4.25	22.90	7.62½	35.00
Sept. 23	10.50	10.62½	10.18¾	29.62½	30.00	5.50	5.35	4.25	22.90	7.62½	35.00

Europe

Larger Buying Follows Price Cutting—Present Level Too Low to Give Makers Profit

London—The characteristic of the past week in iron and steel export markets has been a slight revival of business, accompanied by the low tendency of prices which now have reached a decidedly uneconomic level. Now that European comptoirs for semifinished steel and structural steel have given up all attempts to control prices, competition has been raging, and in many cases, orders are taken below cost.

The report of the London Iron and Steel Exchange states that British makers of semifinished steel are encountering stronger foreign competition, meaning especially Belgium and Luxemburg. It is reported that considerable tonnage has been booked, contracts in some cases extending to the end of the year. Many orders have been placed by Birmingham importers, who have taken advantage of the cheap prices offered.

Continental billets are now offered at about £3 13s ($17.60) f.o.b. Antwerp. One works in Western France has effected sales at £3 12s 6d ($17.60) f.o.b. This material can be delivered in Birmingham at less than £4 15s ($23) while domestic billets are at least £1 ($4.86) more. Similar conditions exist with regard to beams, which can be sold from the Continent to the Birmingham district at £5 7s 6d ($21.10), against the domestic price in Great Britain of £8 10s ($41.20).

Prices Are Too Low

It should be noted in the case of beams that the continental material is basic bessemer, whereas the British product is open hearth, besides, British users who undertake to use British steel exclusively obtain a rebate of 10s ($2.43) per ton. It is obviously impossible that continental works can continue to sell at such low prices, and it is confidently expected that before long the level will have ascended. Up to now the British have made little change in quotations, a drop of about 5s ($1.21) having taken place in the past month. Of course, competition is keen in overseas markets for any orders obtainable. According to British reports demand for steel for export is poor, and the volume is disappointing.

The pig iron market is dull. Foreign competition in Great Britain is still being experienced from India and the Continent. Continental foundry pig iron, 2.5 to 3 per cent silicon, has reached the low price of £2 13s ($12.85) f.o.b. Antwerp. Middlesbrough pig iron is now at £3 3s 6d ($15.40). Small parcels of hematite iron have been shipped from the East Coast to Italy and Scandinavia.

At the end of August a number of engineering contracts were obtained by British firms. These cover especially locomotives and railroad cars for South America and Central Africa; 836 tons of structural steel for a bridge on the Nile, steel bridge work for the Central Argentine railway, and about £130,000 ($600,000) worth of boilers for Russia. An order for a 3500-ton cargo and passenger vessel has been received by Swan Hunter and Wigham Richardson from French owners.

From the Continent it is reported that French works also have entered into competition against Belgian and Luxemburg works for semifinished and structural steel orders. Although the French are comparatively busy with domestic orders, they are now feeling the pinch when it comes to keeping their books filled all round. They have taken orders in the Argentine and the Far East. They also are competing against Belgium and the Saar in the plate market. Germany also has managed to capture some contracts in those markets, and also in Scandinavia. Many German works, on the other hand, are reported to be drawing out of the markets because they find prices are too low.

Entente Reduces Output; Loses Control of Prices

London—(*By Cable*)—The European steel entente meeting in Liege, Belgium, reduced production for the last quarter of the year 25 per cent under that in the comparable period of 1929. While the entente will attempt to function for the present as regards control of output efforts to control prices have failed.

The iron and steel markets in Great Britain are dull. Specifications are slow in the Midland, but improving at Middlesbrough. Current low price offers of continental steel are being refused, consumers having purchased tonnages for immediate needs. The British galvanized sheet association has reduced prices and expects an inflow of export business, though August shipments are the lowest in years. Demand for tin plate is quiet; a price reduction is pending, and merchants are anticipating it by cutting freely.

A report from Paris states a fair tonnage of semifinished steel is being sold, but other business is scarce. The tone of the market in Belgium continues weak. STEEL's correspondent at Berlin reports output by German mills exceeds shipments and further curtailment is likely. Production of pig iron in August declined 4 per cent from that in July.

Price Trend in Belgium Continues Downward

Brussels—Severe competition reigns in the Belgian market and prices are continually falling. In addition to all the various factors which are causing the depression in exports, the trouble now prevailing in South America is far from helping matters in that market, which for a long period was about the only source of important export business for rolled and finished products. Recent meetings of the Brussels iron and steel exchange have been sparsely attended. Buyers are entirely masters of the market.

Sales of pig iron have been scarce, but a few tonnages have been placed in France. The present quotation for No. 3 foundry pig iron (2.5 to 3 per cent silicon) is 600 francs ($16.60) per ton in the domestic market, but concessions are made. The export price for the same grade of iron is from £2 16s to £3 ($13.60 to $14.60) f.o.b. Antwerp. The domestic price for basic bessemer pig iron is 480 francs ($13.35), and £2 15s ($13.35) for export. A number of rerollers have offered to buy semifinished steel of an inferior grade at 600 francs ($16.75), delivered. Some billets have been sold to Great Britain at 6s to 7s ($1.45) to ($1.70) below the official prices.

There have been few transactions in the merchant bar market, this product being offered for export at £4 4s ($20.35) per ton, f.o.b. Antwerp, while the domestic price now is around 775 francs ($21.50). These prices are striking in comparison with the official quotation for 2-inch

Iron Ore
Pig Iron
Coal
Coke

THE CLEVELAND-CLIFFS IRON CO.
Cleveland, Ohio

billets, £4 7s ($21.05). Beams are quoted at £4 16s ($23.20), but the market is stagnant. Wire nails are quoted at £6 4s ($30) for export, and galvanized wire at £7 10s ($36.25), while bright wire is £7 ($33.95). Plates 3/16-inch thick are quoted at £5 4s ($25.10), and ⅛-inch at £5 5s ($25.45).

Small Gain in German Steel

Berlin—The output of pig iron in Germany in July was 770,928 metric tons, about the same daily average as in June. Steel ingots and castings in July amounted to 905,763 metric tons, against 859,310 tons in June, showing a slightly higher daily output, as follows:

Mon. ave.	Pig iron	Steel ingots and castings	Finished steel
1913*	909,640	993,640	970,240
1927	1,091,875	1,359,225	1,069,930
1928	984,700	1,209,770	880,690
1929	1,116,730	1,353,820	940,425
1930			
Jan.	1,092,206	1,275,023	896,076
Feb.	964,517	1,176,435	797,899
March	1,007,576	1,201,206	834,349
April	901,358	1,033,383	737,355
May	859,657	1,034,088	735,741
June	767,395	859,310	603,378
July	770,928	905,763	664,401

*Present boundaries.

French Exports Decrease

Paris—Exports of pig iron from France during the first half of this year amounted to 255,767 metric tons, practically the same figure as that for the corresponding period of 1929. Exports of other iron and steel products decreased 7½ per cent, to 1,659,564 tons this year. Pig iron imports were 92,729 metric tons, and imports of other iron and steel products, including scrap, totaled 147,991 tons. Since the beginning of this year the tonnages imported for reexport after transformation have been included, and this year's figures are not comparable with those of previous years. The following includes the June figures:

Mon. ave.	Pig iron	Other iron and steel products	Pig iron	Other iron and steel products
1927	3,230	7,440	69,640	404,730
1928	3,365	8,320	52,215	368,410
1929	3,345	15,100	46,760	279,610
1930				
Jan.	11,806	22,374	44,016	259,133
Feb.	20,463	24,965	44,977	297,208
March	16,747	28,024	42,522	269,752
April	15,195	25,347	41,630	277,886
May	15,803	23,020	39,576	263,606
June	12,715	24,261	43,046	291,279

French Production Gains

Paris—Production of iron and steel in France in July, although better than in the previous month, still was low in comparison with the figures for 1929. The output of pig iron was 860,000, metric tons, against 841,000 tons in June. Steel ingots and castings in July amounted to 789,000 metric tons, compared with 753,000 tons in June, as follows:

Mon. ave.	Act. Fur. on last day	Pig iron	Steel ingots and castings
1913	131	433,940	390,580
1927	142	774,785	689,610
1928	153	841,415	782,995
1929	156	870,000	805,500
1930			
Jan.	156	875,000	800,000
Feb.	154	815,000	772,000
March	152	898,000	848,000
April	153	854,000	787,000
May	154	899,000	853,000
June	.....	841,000	753,000
July	147	860,000	789,000

Belgian Steel Output Up

Brussels—Production of pig iron in Belgium in July showed a further decline to 259,750 metric tons, compared with the previous low figure of 265,290 tons in June. A slight improvement was obtained in the output of steel ingots and castings, which in July amounted to 263,980 metric tons, compared with 252,680 tons in the preceding month, as follows:

Mon. ave.	Act. Furn.	Pig iron	Steel ingots and castings	Finished steel
1913	....	207,055	205,550	154,920
1927	....	312,620	309,040	255,185
1928	....	325,445	327,870	281,125
1929	58	341,330	344,370	296,370
1930				
Jan.	58	343,380	340,200	296,220
Feb.	57	315,320	321,480	271,430
Mar.	57	341,820	359,150	258,770
April	56	313,250	312,550	252,150
May	54	299,510	294,160	240,900
June	51	265,290	252,680	204,590
July	49	259,750	263,980	209,060

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, September 22

	British Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$15.43	3 3 6*	$12.88	2 13 0	$12.88	2 13 0	$13.37	2 15 0
Basic-bessemer	15.92	3 5 6	12.88	2 13 0	12.88	2 13 0	13.37	2 15 0
Hematite, Phosphorus 0.02-0.05	17.25	3 11 0	24.76	630*	.....	.....	17.74	3 13 0
SEMIFINISHED STEEL								
Billets	$27.95	5 15 0	$17.74	3 13 0	$17.74	3 13 0	$18.47	3 16 0
Wire rods	41.31	8 10 0	30.38	6 5 0	30.38	6 5 0	31.59	6 10 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.60	6 10 0	$31.60	6 10 0	$32.08	6 12 0
Merchant bars	1.68c	7 15 0	.94c	4 5 0	.94c	5 5 0	.95c	4 6 0
Structural shapes	1.68c	7 15 0	.89c	4 1 0	.89c	4 1 0	.92c	4 4 0
Plates, ship, bridge and tank	1.79c	8 5 0	1.11c	5 1 0	1.11c	5 1 0	1.19c	5 8 0
Sheets, black, 24 gage	2.17c	10 0 0	1.93c	8 15 0	1.93c	8 15 0	2.31c	10 10 0
Sheets, galvanized, 24 gage, corrugated	2.41c	11 2 6	2.46c	11 3 9	2.46c	11 3 9	3.19c	14 10 0
Bands and strips	2.17c	10 0 0	1.10c	5 0 0	1.10c	5 0 0	1.17c	5 6 0
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.43c	6 10 0
Galvanized wire, base	3.04c	14 0 0	1.65c	7 10 0	1.65c	7 10 0	1.67c	7 12 0
Wire nails, base	2.39c	11 0 0	1.38c	6 5 0	1.38c	6 5 0	1.49c	6 15 0
Tin plate, base box 108 pounds	$ 4.38	0 18 0	.....	.....	.....	.....	$8.75	1 16 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$15.43	3 3 6	$19.26	490(2)	$16.74	600	$19.78	83
Basic pig iron	15.92	3 5 6	20.63	525(1)	13.39	480	21.09	88.50
Furnace coke	3.16	0 13 0	6.60	168	5.30	190	5.12	21.50
Billets	27.95	5 15 0	22.20	565	18.69	670	28.00	117.50
Standard rails	1.79c	8 5 0	1.46c	810	1.62c	1,245	1.47c	136
Merchant bars	1.68c	7 15 0	1.18c	655	.97c	745	1.48c	137
Shapes	1.84c	8 10 0	1.26c	700	1.11c	850	1.45c	134
Plates, ship, bridge and tank	1.90c	8 15 0‡	1.46c	810	1.25c	960	1.65c	153
Sheets, black, 24 gage	2.28c	10 10 0	2.72c	1,510	2.47c	1,900	1.36c	126
Sheets, galvanized 24 gage, corrugated	2.58c	11 17 6	3.52c	1,955	2.60c	2,000	3.67c	340
Plain wire	2.06c	9 10 0	2.03c	1,125	2.15c	1,650	2.34c	217
Bands and Strips	2.17c	10 0 0	1.26c	700	1.37c	1,050	1.72c	159

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.16) f. o. b. Ferromanganese £19 6s 0d ($93.80) delivered Atlantic seaboard, duty-paid. German ferromanganese £12 5s 0d ($59.54) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.

Machinery

STEADY, though small, buying of individual tools and continued interest on the part of inquirers is the best that can be said of the machine tool market. The rate of buying has shown no increase since the first of the month and present inquiry is not promising for large buying. In some markets September business is expected to be greater than in August. Electrical and agricultural implement manufacturers seem likely to buy considerable equipment for enlarged operations soon. One railroad purchase has provided small business in the West. Adjustments in prices of milling machines and lathes have caused some minor advances. Delay has been met in delivering on a large order to a Chicago user.

New York—While machine tool sellers report general improvement over a month ago, trading is confined largely to orders for individual machines. Until the leading buyers, notably electrical manufacturers, enter the market, no marked gain is expected. Railroad demand continues the smallest in many months, with no lists in immediate prospect.

Crane buying also continues light. Greater interest prevails but it is transforming slowly into actual inquiries. In point of actual inquiry some leading sellers assert they can see little gain from a month ago and that the volume of buying is unchanged.

Worcester, Mass.—Some activity in grinders has been noted by smaller producers. Lack of demand from tractor shops has kept the general market below its usual rate. Outside of some Russian business and awards of the American Locomotive Co., however, the market has shown no great strength. Lathes and drills have slumped slightly.

Pittsburgh—Orders and inquiry for machine tools are steady. Demand has shown little change since the first of the month, sales still being limited to small individual orders. Inquiry and pending work are moderately heavier than a month ago, but hesitancy to close causes sellers to have little optimism regarding the near future outlook.

Chicago—Further evidences are noted of an improved position for machine tools. Sales were not heavy during the week, but prospective buyers continue to shop. Inquiry remains quiet, but a number of projects are pending. One or two of the houses reporting a marked pick-up in the last five or six weeks found a slight falling off in sales during the week. Several dealers report September sales gaining over August. An interesting development is the fact that International Harvester Co. is known to be preparing a substantial budget for 1931. That corporation's replacement needs will be of importance. Not much is expected from tractor and implement plants this year. Majestic Household Utilities Corp. is not expected in the market soon. Delay of about two weeks in getting into operation has been necessitated because of adjustments to its precision machines. Missouri-Kansas-Texas railroad has purchased $20,000 worth of equipment at St. Louis, some of which will be furnished from this market. Chicago purchased an 18-inch lathe and a milling machine for William Hale Thompson pumping station. Manufacturers in southern Indiana and central Ohio purchased in this market equipment that had been pending for some time. Price adjustments between sizes of milling machines and lathes, effective Sept. 15, have resulted in several minor advances.

Cleveland—Some scattered buying of single tools or small lots is being done by machine tool users and inquiry of a tentative sort is being done. On the whole, however, trade is dull and bookings are small. Inquirers seem inclined to delay closing until the trend of the future is more definitely seen and sellers find their best efforts unavailing to close on these nibbles. No important lots are pending in this market and signs point to no immediate activity.

Hoist Orders Gain; Shipments Are Less

New York—Members of the Electric Hoist Manufacturers' association report the number of hoists ordered during August increased 9.677 per cent compared with the previous month, and the value of such orders decreased 18.3138 per cent compared with July, 1930.

Shipments were 17.4945 per cent smaller in August than in July, 1930.

Business Index Is Lower

(*Concluded from Page 27*)

with 90.7 for July and 97.6 for August, 1929, according to the bureau of labor statistics. Structural steel for August was 84.3, the same as in July, compared with 99.6 for August last year. The index is based on 1926 as 100.

Structural Orders Increase

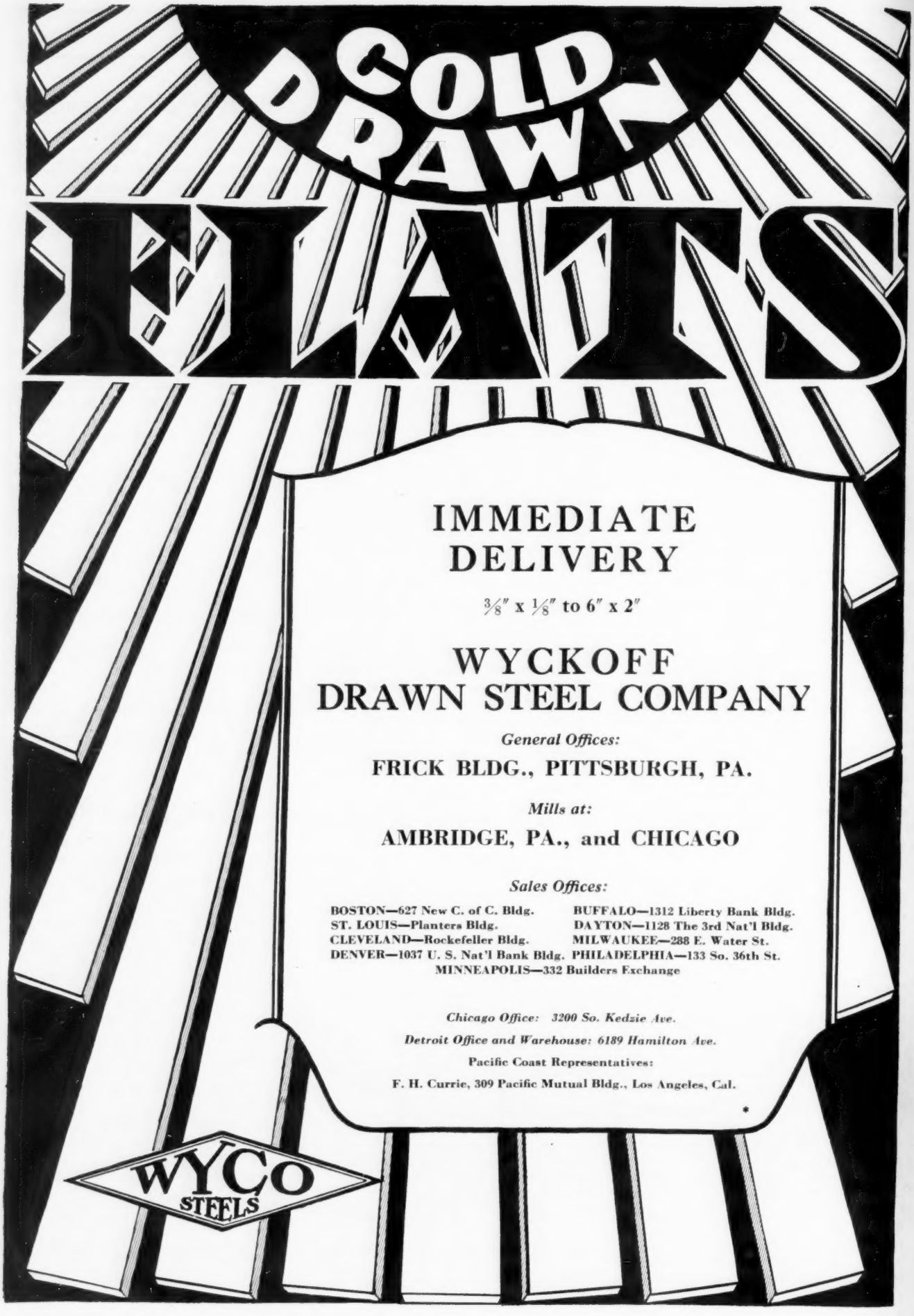
Fabricated structural steel orders in August showed a gain from July, according to the department of commerce. Shipments by computation for the month were off, though 8-month shipping totals are comparable to 1929, in the following:

1929	New orders (tons)	Computed tonnage	Shipments computed tonnage
Aug.	301,964	361,900	338,800
(8 mos.)	2,191,466	2,625,700	2,336,950
Sept.	264,056	315,700	315,700
Oct.	282,973	338,800	350,350
Nov.	187,760	227,150	284,900
Dec.	263,498	315,700	265,650
(Year)	3,189,753	3,823,050	3,553,550
1930			
Jan.	212,106	252,000	244,000
Feb.	237,166	284,000	300,000
March	208,951	248,000	280,000
April	196,409	236,000	300,000
May	243,513	296,000	280,000
June	226,854	276,000	300,000
July	211,555	284,000	304,000
Aug.	217,174	264,000	280,000
(8 mos.)	1,753,728	2,140,000	2,288,000

Steel Plate Orders Recede

Orders of fabricated steel plate in August were 29,235 tons, less than the July figure and the lowest month of 1930 with the exception of February. Increases were shown in material going into blast furnaces, stacks and miscellaneous, by department of commerce reports following:

1929	Total	Oil storage tanks	Blast furnaces	Stacks & miscellaneous
Aug.	39,702	11,150	115	19,341
(8 mos.)	373,483	102,173	8,526	161,123
Sept.	41,653	15,189	200	16,123
Oct.	32,099	8,786	853	15,766
Nov.	42,295	9,033	1,019	14,601
Dec.	23,535	3,669	1,529	13,166
Total (year)	513,065	138,850	12,127	220,781
1930				
Jan.	50,076	7,432	1,042	15,168
Feb.	28,332	7,865	279	11,656
March	38,051	6,593	2,749	17,675
April	39,437	8,460	273	17,698
May	30,306	9,222	426	13,228
June	34,073	8,841	511	15,650
July	30,862	10,850	102	12,587
Aug.	29,235	9,388	750	15,695
(8 mos.)	280,372	68,651	6,132	119,357


COLD DRAWN
FLATS
IMMEDIATE DELIVERY
3/8" x 1/8" to 6" x 2"
WYCKOFF DRAWN STEEL COMPANY
General Offices:
FRICK BLDG., PITTSBURGH, PA.
Mills at:
AMBRIDGE, PA., and CHICAGO
Sales Offices:
BOSTON—627 New C. of C. Bldg.
BUFFALO—1312 Liberty Bank Bldg.
ST. LOUIS—Planters Bldg.
DAYTON—1128 The 3rd Nat'l Bldg.
CLEVELAND—Rockefeller Bldg.
MILWAUKEE—288 E. Water St.
DENVER—1037 U. S. Nat'l Bank Bldg.
PHILADELPHIA—133 So. 36th St.
MINNEAPOLIS—332 Builders Exchange
Chicago Office: 3200 So. Kedzie Ave.
Detroit Office and Warehouse: 6189 Hamilton Ave.
Pacific Coast Representatives:
F. H. Currie, 309 Pacific Mutual Bldg., Los Angeles, Cal.
WYCO STEELS

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

NEW HAVEN, CONN.—New Haven airport, at Morris cove, will build hangar units, 80 x 100 feet, 20 x 100 feet, and 20 x 50 feet, at a cost of about $40,000. Leo F. Caproni & Co., 1044 Chapel street, have plans.

MALDEN, MASS.—Malden Electric Co., J. T. Day manager, 157 Pleasant street, will build a distribution station, laboratory and warehouse on Centre street. Plans are private. Cost is estimated at approximately $50,000.

SPRINGFIELD, MASS.—United Electric Co., 73 State street, will build a coal handling plant and equip it with conveying equipment. McClintock & Craig, engineers, 458 Bridge street, are taking bids.

New York

AUBURN—Department of correction, state building, Albany, N. Y., will receive bids for a shop and foundry to be built here. Estimated cost, $40,000.

BROOKLYN—Metal Bed Refinishing Co. has been incorporated with $10,000 capital by M. M. Cohen, 16 Court street.

BROOKLYN—Summergrade has been incorporated with 1000 common shares by I. N. Thurman, 383 Seventh avenue, New York, to deal in machinery.

BROOKLYN—Efficiency Steel Units Inc., whose incorporation recently was noted, has leased space at 78 Nineteenth street. Company will manufacture printers' equipment, steel cabinets, counters, platforms and office partitions. (Noted Sept. 18.)

BROOKLYN—Standard Oil Co. of New York, 26 Broadway, New York, will build a 2-story, 100 x 300-foot garage and shop at Henry and Cayles streets here. Cost is estimated at about $160,000. Dietrich Wortmann, 116 Lexington avenue, New York, architect, is receiving bids.

BUFFALO—Martin & Schwartz Inc., 2651 Main street, has acquired the former plant of the Automatic Transportation Co. at 2933 Main street, and will move to the new location, where 60,000 square feet of floor space will be available.

NEW YORK—Keystone Screw Corp. has been incorporated with $10,000 capital by S. Herschkowitz, 55 West Forty-second street, to deal in hardware.

NEW YORK—Fire recently damaged the plant of Progressive Metalware Corp., 542 Water street. Company manufactures ash, garbage and oil cans.

NEW YORK—Allied Motors Corp. of New York has been incorporated by Simpson, Thatcher & Bartlett, 120 Broadway, to deal in machinery.

NEW YORK—Marble Electric Co. has been incorporated by Van Doren, Conklin & McNevin, 31 Nassau street, to deal in electrical machinery.

NEW YORK—Sound Apparatus Corp. has been incorporated by Banzahg & Richter, 130 West Forty-second street, to deal in recording instruments.

NIAGARA FALLS—U. S. L. Battery Corp. plant recently was damaged by an explosion and fire. Estimated loss, $40,000.

Pennsylvania

CORRY—Chamber of commerce is negotiating with Aero Supply Corp., George L. Stich president, to bring units of the company at College Point, N. Y., and Dayton, O., to locations here. Another unit, Standard Automatic Products Co., has been moved here.

IRWIN—Irwin Welding & Machine Co. will occupy an addition to its plant, now being built by H. E. Steiner. Addition will double the available floor space.

PHILADELPHIA—Quaker City Art Metal Co., 2445 North Second street, closed bids Sept. 24 for construction of a plant addition. Alvin C. Bieber, Bonbright building, is architect.

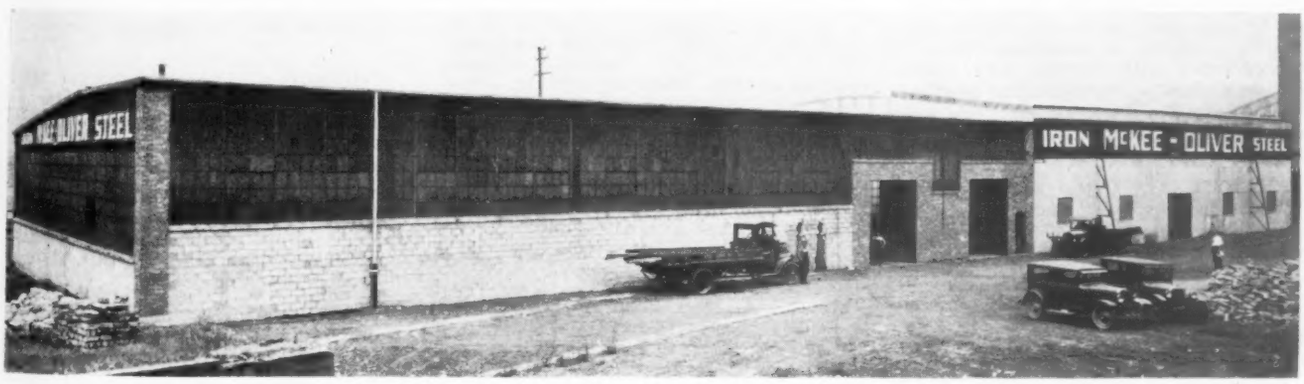
PHILADELPHIA—Wheeling Corrugating Metal Co. Ltd. has been incorporated with $50,000 capital by Samuel M. Mehr, Canadian Pacific building, to carry on the business of metallurgist and metal worker.

PHILADELPHIA—Duoflex Piston Ring Co., Fifteenth and Mt. Vernon streets, has awarded contract to Golden Construction Co., 1600 Arch street, for the construction of a storage unit on Seventy-first street, north of Hoy street. Cost is estimated at $25,000.

PHILADELPHIA—Pennsylvania railroad, T. J. Skillman chief engineer, Broad street station, Seventeenth and Arch streets, has awarded contract to Turner Construction Co., 1700 Walnut street, for a 3-story, 202 x 388-foot warehouse to be built on Thirty-eighth street.

SHARON—Hangar and contents at Bowers airport, owned by Frank Bowers,

Pittsburgh Steel Distributors Enlarge Plant



McKee-Oliver Inc., Pittsburgh, has completed additions to its new warehouse recently erected for the distribution of steel products. Additions include extensions to craneways, roof for the structural and plate yard and the installation of new cutting and keyseating machinery. Sheet and plate shears and cold sawing equipment have been provided. The company specializes in cold finished steel bars, structural shapes, angles, plates and sheets and is mill representative for the Lukens Steel Co., Moltrup Steel Products Co., Franklin Steel Works, Cumberland Steel Co. and Buckeye Rolling Mill Co.

recently were destroyed by fire. Estimated loss, $15,000.

SUNBURY—Pennsylvania Power & Light Co., Allentown, Pa., plans to build a power plant here at a cost of about $15,000,000.

New Jersey

CARTERET—United States Metal Refining Co., Delamar avenue, will build a refining plant at a cost of about $40,000. Plans are private.

DEAL—New Jersey Bell Telephone Co., 540 Broad street, Newark, N. J., has awarded contract for a 1-story laboratory here. Cost is estimated at $40,000.

ELIZABETH—Rawson Brake & Equipment Co., Detroit, has leased 10,000 square feet of floor space in the Durant plant, recently taken over by Bayway Terminal Inc., and will move its plant operations here about Oct. 1.

MONTCLAIR—Public Service Production Co., 80 Park place, Newark, N. J., plans to erect a garage, shop, and a boiler house in connection with a group of buildings at 101 Greenwood avenue, here. Cost of the project is estimated at $150,000.

NEW BRUNSWICK—Radio Corp. of America, Woolworth building, New York, will build a radio station here at a cost of about $2,000,000. C. MacKenzie, architect, 119 Broad street, New York, will take bids about Oct. 15.

NEWARK—J. Berkowitz Inc., 359 Plane street, will build a 3-story 170 x 475-foot warehouse at a cost of about $150,000. S. Cohen, 134 Branford place, is architect.

Ohio

AKRON—Alluloy Products Co. has been incorporated with 250 no par shares by Bailey & McGinley, 1009 Second National building.

CANTON—Canton Tin Plate Corp., recently organized by Samuel Davey and W. R. Jenkins, of Mansfield, O., and incorporated with $250,000 and 25,000 no par shares, is improving the plant of the Falcon Tin Plate Co., for the production of tin plate and tin mill specialties.

CLEVELAND—Green Scrap Iron & Metal Co. has been incorporated by Peter E. Klein, 711 Leader building, to deal in scrap metals.

CLEVELAND—American Screw Products Co., has been incorporated with $50,000 capital by Stevens & Gillis, 1424 Engineers building.

CLEVELAND—Engine repair shops of the Toledo & Ohio Central railroad will be moved from Bucyrus, O., to the Collinwood shops of the New York Central railroad, Nov. 1.

CLEVELAND — International Harvester Co. of America, 2905 Chester avenue, will lease a building containing 25,000 square feet of floor space from the K-W Ignition Corp., 2811 Chester avenue, for occupancy upon construction. International company has leased a present building of the K-W company, on East Twenty-seventh street, containing 23,000 square feet of floor space. Contract has been awarded to Austin Co., 16112 Euclid avenue, for construction of the Chester avenue unit. Estimated cost, $135,000.

LIMA—Universal Machine Co., Bowling Green, O., manufacturer of universal joints, is reported to be considering a removal of its plant to a location in a portion of the plant of Superior Motor Coach Body Co., East Kibby street and Mandeville avenue. H. L. Breckenridge is president of the Superior company and an officer of the Universal company.

MARIETTA—City council proposes to build a light and power plant at a cost of about $100,000.

SANDUSKY—City, C. Webb Sadler city manager, is considering a site on Hayes avenue for an airport. A bond issue of $200,000 is proposed for the November election.

Indiana

ANDERSON—Powercraft Motors Corp., recently noted as planning operations here, is negotiating for the manufacture of outboard motor boats. Victor Wright, formerly of Wright-Tuttle Aircraft Co., heads the Powercraft company. (Noted Sept. 11.)

ANDERSON—Hanson, Van Winkle & Munning, 1520 West Second street, have acquired the plant of Nyberg Automobile Co., consisting of 30,000 square feet of floor space, and will move Detroit and Chicago operations here. Expansion will eventually increase space to 100,000 square feet. Company is in the market for machinery and equipment for the manufacture of polishing and plating machinery. Roy E. Shockley is in charge of the local plant.

AUBURN—Hoff Motor Co. has plans for a 2-story, 32 x 70-foot shop and service station. Plans are private. Estimated cost, $50,000.

INDIANAPOLIS—Beach & Arthur Inc., 221 West South street, is building a plant at 2900 Columbia avenue, at a cost of about $75,000. Harry Fitton, 958 North Pennsylvania avenue, is architect.

SOUTH BEND—Bendix Aviation Co. proposes to erect Plant B at a cost of about $125,000. Plans are private.

Michigan

DETROIT—Barnes Wire Fence Co., 10371 Northlawn avenue, has awarded contract to G. T. Proctor, 7349 Dunedin road, for a new plant unit.

DETROIT—Bohn Aluminum & Brass Co., 2512 East Grand boulevard, will build a 1-story, 40 x 300-foot plant addition on Joseph Campau avenue. Cost is estimated at $45,000. C. W. Brandt, architect, Francis Palms building, is receiving bids.

MUSKEGON—Jiffy Jack Co. has been incorporated with $10,000 capital by C. J. Albertie to deal in automobile jacks and accessories.

Illinois

CHICAGO—Electromatic Record Changer Corp. has been incorporated with $30,000 capital by Pritzker & Pritzker, 134 North LaSalle street, to deal in phonograph parts.

CHICAGO—Continental Airway, 5032 West Sixty-third street, has a building permit for construction of an 85 x 160-foot hangar. Estimated cost $35,000.

CHICAGO—Mercury Mfg. Co., 4110 South Halstead street, recently suffered fire damage at its plant. Estimated loss, $25,000. Company manufactures electric warehouse tractors, trucks and trailers.

CHICAGO—Super Auto Service & Machine Shop Inc., 2429 South Wabash avenue, has been incorporated with $10,000 capital by Ernest J. Camit, 160 North LaSalle street, to engage in a general machine shop business.

CHICAGO—John A. Ek Inc., 1410 East Seventieth street, has been incorporated with 200 no par shares by Nelson, Burton & Quindry, suite 1200, 105 South LaSalle street, to manufacture and sell machinery and appliances.

CHICAGO—Oil Stove Corp., 125 West Madison street, has been incorporated with $20,000 capital by Karlin, Cohen & Karlin, 228 South LaSalle street, to deal in heating apparatus.

CHICAGO—Norman Oil Burner Corp., 230 North Michigan avenue, has been incorporated with 2500 no par shares by Charles C. Bartlett, First National Bank building, to deal in equipment for heating.

CHICAGO—Chicago Mechanical Mfg. Co., 1301 Elston aveinue, has been incorporated with $1000 and 200 no par shares by William Beebe, 11 South LaSalle street.

GLENCOE—Public Service Co. of Northern Illinois has awarded contracts for a 2-story equipment storage and distributing plant, 300 x 326 feet. Equipment will be purchased.

NOKOMIS—Indiana & Illinois Coal Co. has had preliminary plans prepared for remodeling its coal tipple at Mine No. 10, and for the construction of a coal screening plant.

OREGON—Paragon Kol-Master Corp. has been incorporated with 30,000 no par shares by John H. Coulter, Harris Trust building, Chicago, to deal in mechanical equipment.

Missouri

KANSAS CITY—Welded Products Corp. has acquired 11 acres in a site adjoining its present property, to be used for expansion.

ST. CHARLES—City has authorized plans for the construction of a municipal light plant.

ST. LOUIS—Board of education, 911 Locust street, has a building permit for a power plant to be erected at 3411 School street. Cost is estimated at $100,000.

Arkansas

BENTON—State is having plans prepared for a group of buildings to be erected here at a cost of $3,000,000. Central power and heating plants will be included. Mann, Wanger & King, Donaghey building, Little Rock, Ark., are architects.

PINE BLUFF—Peers & McGlone have awarded contract to E. C. Royce Construction Co. for a 30 x 180-foot addition to their auto body manufacturing plant on West Sixth avenue. Plant size will be increased by 25 per cent.

Oklahoma

BARTLESVILLE—Phillips Petroleum Co., care of William Parker, private airport manager, plans improvements to its airport here, including erection of a machine shop for repair work on planes.

OKLAHOMA CITY—J. A. Werme Steel & Iron Co., 510 North Indiana avenue, has let contract for the erection of a warehouse addition, 30 x 90 feet.

TULSA—City will add two low lift motor-driven pumps to its Mohawk pumping station. Victor H. Cochrane, engineer, Wright building, is preparing plans.

VINITA—City is having plans prepared for a municipal light plant. Russell & Axon, McDaniel building, Springfield, Mo., are architects. Cost is estimated at $200,000.

Texas

BRYAN—City council and Texas Agricultural & Mechanical college propose to build an airport here. Site is pending.

DALLAS—R. E. Davis has let contract for the erection of a machine shop at 2823 Williams street. Cowdin Bros., 1813 Main street, have been awarded the contract. Estimated cost, $12,000.

HOUSTON—E. M. Biggers, 4300 Caroline street, is erecting a machine shop, 40 x 60 feet.

HOUSTON—Houston Independent School district, care of H. L. Mills, is receiving bids for miscellaneous equipment at Taylor vocational school machine shop.

HOUSTON—Southland Greyhound Lines, 713 Milam street, has let contract for a shop and garage, 80 x 200 feet.

HOUSTON—Sinclair Refining Co. is enlarging its oil refinery on Houston ship channel and will make additions to its pumping plant and boiler house. J. W. Duckett is plant superintendent in charge.

LONGVIEW—J. K. Bivins Lumber Co., Moberly and Young streets, will receive bids for engines and portable boilers.

PORT ARTHUR—City will build a central pumping plant, 50 x 84 feet, and is considering erection of two smaller units. J. B. Converse Engineering Co. is engineer.

Wisconsin

ASHLAND—American Black Granite Co. is adding to its cutting and polishing plant.

CEDARBURG—Hansen Canning Machinery Co., W. W. Singer president, has let contracts for the erection of a 1-story machine shop addition, 28 x 100 feet.

MENASHA—International Wire Works Co., manufacturer of paper and pulp mill screens, is constructing a shop addition. Estimated cost, $30,000. Addition will be occupied about Nov. 1.

MILWAUKEE—A. L. Kiefer Co., 329 East Water street, manufacturer of hotel equipment, hardware, etc., is taking bids for a new 2-story plant, 68 x 120 feet, to be built at Twenty-second and Clybourn streets. J. A. Lucas is manager of the company. Cost is estimated at $50,000.

RACINE—J. I. Case Co., 500 State street, manufacturer of agricultural implements, is improving and enlarging its main forge shop. Cost is estimated at $50,000.

WAUKESHA—Butler Bin Co., manufacturer of steel bins, gravity conveyors and metering and measuring devices for minerals, has awarded contracts for the construction of a shop addition, 80 x 100 feet. Cost is estimated at $45,000, with equipment.

WAUSAU—Wausau Motor Parts Mfg. Co., 125 West Washington street, is negotiating with the city council for a site for a new plant, to be built as soon as possible. A 1-story structure is planned, 80 x 240 feet. Karl Mathis is president.

Minnesota

HIBBING—Great Northern Iron Ore Properties, 509 Third avenue, will build a 2-story warehouse at a cost of $60,000. B. M. Conklin is architect and Arthur Mining Co. is engineer.

South Dakota

QUINN—Earl Bronson proposes to build a light plant here, after obtaining a franchise from the city.

Iowa

AMES—State highway commission will build maintenance shops at Spirit Lake and Odebolt, and maintenance garages at Columbus Junction, Grinnell and Des Moines. Contracts have been awarded.

COUNCIL BLUFFS—Plant of M. D. Richman Auto Parts Co., 2748 West Broadway, recently was severely damaged by fire. Loss is estimated at $7000.

Colorado

PUEBLO—American Safety Device Co. has been incorporated here with $50,000 capital by Ralph F. Kuntz, president. Company will manufacture a safety device for moving picture machines.

Idaho

SODA SPRINGS—City has voted $30,000 for the construction of a municipal hydroelectric plant.

Southern States

WILMINGTON, DEL.—Crownte
WILMINGTON, DEL.—Crowntex Corp. has been incorporated with 3300 common shares by Corporation Trust Co. of America, du Pont building, to deal in machinery.

WASHINGTON—O. J. Maigne Co., 332 C street, will resume plans for a new plant, originally announced for last spring, and will receive bids about Jan. 1 for a 3-story plant for the manufacture of printers' rolls. Dodge & Morrison, 160 Pearl street, are architects.

MAYFIELD, KY.—Mayfield Aviation club, Dr. Frank Happy president, is investigating sites for an airport.

MT. STERLING, KY.—Harry Kerslake plans to move his machine shop from Paris, Ky., to a new location here.

CUMBERLAND, MD.—Plant leased from Western Maryland railway by Cumberland Machinery Co., Vang Construction Co., Vang & Shriver Oil Co. and Tri-State Engineering Co. recently was virtually destroyed by fire. Estimated loss, $150,000.

LONG BEACH, MISS.—City, J. A. McCormick clerk, will receive bids until Oct. 7 for one 350-gallons per minute centrifugal pump, direct connected to motor, complete with fittings.

VICKSBURG, MISS.—Yazoo Portland Cement Co., Ralph T. Miller, Nashville, Tenn., president and general manager, plans erection of a cement plant here

with an annual capacity of about 1,000,000 barrels. A machine shop will be included.

WILSON, N. C.—City has awarded contract to Beaman & Coleman Construction Co., Lawyers' building, Raleigh, N. C., for the construction of a power plant addition. Approximate cost, $40,000.

COAL CREEK, TENN.—Southern Coal & Coke Co., Knoxville, Tenn., plans to add equipment and build a tipple at its mining properties here. Cost is estimated at about $150,000.

WEIRTON, W. VA.—Fire recently damaged the plant of Weirton Steel Co., doing principal damage to the benzol plant. Loss is estimated at about $10,000.

Pacific Coast

LOS ANGELES—National Union Radio Corp., New York, is reported to be investigating sites through the chamber of commerce. Company considers erection of a plant for making radio tubes. Estimated cost, $300,000.

OAKLAND, CALIF.—L. DeSanno, 1853 Thirty-eighth avenue, will build a machine shop, pattern shop and foundry on Chapman street. Cost is estimated at $15,000.

PASADENA, CALIF.—City will call for new bids for boilers to be installed in the municipal power plant. Previous bids were rejected. (Noted Aug. 7.)

BELLINGHAM, WASH.—Puget Sound Power & Light Co., Seattle, has plans for a power substation heree.

LONGVIEW, WASH.—Campbell Fuel Co. is constructing a machine and equipment repair plant. Garage facilities are being increased.

SEATTLE—Apex Sheet Metal Works has plans for a proposed plant unit, 60 x 120 feet, to be built at 933 Twelfth avenue.

SEATTLE—Port of Seattle has had plans prepared for a repair shop, 38 x 48 feet, to be erected at 2000 West Garfield street.

SEATTLE—Olympic Machinery & Storage Co., organized by Bert Danley and Frank J. McHugh, has established a yard at 1054 Elliott avenue and will specialize in used equipment and rentals.

Dominion of Canada

CRANBROOK, B. C.—Cranbrook Foundry & Machine Shops Ltd. is having plans prepared for a 2-story foundry and machine shop at Cranbrook and Kootenay streets. Structure will be 40 x 60 feet and will cost $12,000.

FT. WILLIAM, ONT.—Bole Elevator Co. Ltd. has been incorporated with $50,000 capital by William L. Bole, to manufacture and deal in merchandise.

TORONTO, ONT.—Auto Vehicle Parts Co. Ltd. has been incorporated with 8000 no par shares by Richard G. Meech, 38 King street west, to manufacture and deal in automobile body and trimming hardware and other metallic products.

WESTON, ONT. — Jamesway Ltd., division of James Mfg. Co., Ft. Atkinson, Wis., manufacturer of barn equipment and poultry supplies, has leased a plant here and will begin production.

MONTREAL, QUE.—Auburn Stoker Corp. (Canada) Ltd. has been incorporated with 500 no par shares by Frederick W. Pennock, 1430 Bleury street, to carry on the business of mechanical, electric and hydraulic engineers.

New Trade Publications

SPEED REDUCERS—The Falk Corp., Milwaukee, has issued Bulletin 230 describing its latest types of parallel shaft speed reducers and flexible couplings. The booklet is well illustrated, showing mechanical details and various installations in actual service. It tells how to select units, giving complete data respecting ratings and ratios.

CRANES—Under the title "Maximum Lift in Minimum Headroom" the Whiting Corp., Harvey, Ill., has issued a folder descriptive of its new cranes. High lift, with low headroom, simple design, easy accessibility, roller bearings, oil-tight gear case and sturdy gearing are some of their features. Folder includes a diagram and table of clearances.

WELDED WIRE FABRIC MACHINE—Thomson-Gibb Electric Welding Co., Bay City, Mich., has issued a leaflet describing and illustrating an automatic fabric welder which is said to weld 151,000 square feet of fabric or 54 tons per ten hour day. The machine is equipped with 37 transformers for the welding of fabric as wide as 12 feet.

AUTOMATIC SCREW MACHINES—Davenport Machine Tool Co. Inc., Rochester, N. Y., has published a 54-page booklet describing its model B automatic screw machine and giving complete instructions for its operation. The machine has five spindles, single silent chain drive. Quick indexing of work, separate feed for each tool, a wide range of spindle speeds, compensating stops for forming slides and tool arms are some of the many points featured.

COKE RETORTS—A flow sheet and description of continuous coke retorts for producing low or high temperature coke with a maximum recovery of by-products are incorporated in a folder released by the Meier Coke Retort Co., Kirkwood, Mo. Twenty points of advantages and benefits are enumerated. An analysis of operation and results obtained by the St. Louis Sampling & Testing Works Inc., is included.

OVENS—Gehnrich Oven Co. Inc., Long Island City, N. Y., has issued a booklet outlining the construction, design and features of the various industrial ovens the company manufactures. It is divided into eight sections devoted to the following subjects: Features of construction; industrial gas ovens; industrial electric ovens; representative installations; foundry ovens; industrial air heaters; dual panel and oven trucks, racks and trays.

STRAIGHTENING ROLLS—Kane & Roach Inc., Syracuse, N. Y., have published a leaflet describing some of their recent installations. Their line comprises 80 types and sizes of standard straightening machines for handling rounds, squares, hexagons, octagons flats, angles, special shapes, sheets, plates and wire. The leaflet features equipment used in the production of Franklin automobiles.

DRIVES—Goodyear Tire & Rubber Co. designed special endless V-shaped rubberized cord belts, and the Worthington Pump & Machinery Corp., Harrison, N. J., designed the sheaves and solved the problems of application. The latter will manufacture the sheaves and sell the complete drive, adapting it to each installation requirements. How these two companies collaborated in "Harnessing Industry Anew" is told in a folder issued by the Worthington company.

MANGANESE STEEL FEEDER—Stephens-Adamson Mfg. Co., Aurora, Ill., conveyor manufacturer, have just published a folder describing a new type of feeder, designed primarily to handle abrasive materials in large tonnages. It contains illustrations, tables of capacities, dimensions and building clearances. Diagrams show construction of the manganese steel pans that interlock to form a rigid conveyor surface upon which carloads of ore, stone and the like can be dumped.

COOLING AND VENTILATING—Architectural bulletin No. 2 issued by the American Rolling Mill Co., Middletown, O., deals in an interesting way with the cooling and ventilating of the new Minneapolis civic auditorium in which galvanized ingot iron was used for the entire system. The structure when completed will occupy two entire city blocks and have a seating capacity of 18,000. Unusual problems were met with by the designers. Copies of blueprints are part of the general description.